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** | Course Change in the Applied Chemistry Bachelor of Science |
| **Date** | December 6th, 2018 |
| **Major or Minor** | Major |
| **Proposers Name** | Alberto Martinez, Diana Samaroo |
| **Department** | Chemistry |
| **Date of Departmental Meeting in which proposal was approved** | December 6th, 2018 |
| **Department Chair Name** | Diana Samaroo |
| **Department Chair Signature and Date** | Picture 212/28/2018 |
| **Academic Dean Name** | Justin Vazquez-Poritz |
| **Academic Dean Signature and Date** | Picture 1 1/27/19 |
| **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. | This major curriculum change proposal intends to modify the course name, course number, pre-requisites, description, credits and hours of the existing course in Advanced Spectroscopy (CHEM4322/L), from a 4 credit (3 h lecture, 3 h laboratory) to a 2 credit (4 h laboratory) course. The proposed new name is Advanced Laboratory Applications of Spectroscopy (CHEM4323)This major curriculum change goes together with a minor curriculum change proposal that intends to replace the required second Internship/Research in Applied Chemistry course (CHEM4902) by the course Advanced Laboratory Applications of Spectroscopy (CHEM4323). |
| **Brief Rationale for Proposal**(Provide a concise summary of why this proposed change is important to the department. More detailed content will be provided in the proposal body).  | The proposed change will adapt CHEM4323 to better serve the needs of students, and to better fit the purpose of the Applied Chemistry program, by providing high-level experimentation and applied chemistry training in spectroscopic techniques. This proposal goes together with a minor curriculum change proposal to convert CHEM4323 into a required course of the BS in Applied Chemistry. |
| **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**

|  |  |
| --- | --- |
| 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 departmentsList of the programs that use this course as required or elective, and courses that use this as a prerequisite. | N/A |
| 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) | ✓ |

**Section AV: Changes in Existing Courses**

**AV.1. Chemistry**

**Changes to be offered in the Chemistry Department**

|  |  |  |  |
| --- | --- | --- | --- |
| **CUNYFirst Course ID** |  |  |  |
| **FROM:** |  | **TO:** |  |
| **Department(s)** | Chemistry | **Department(s)** | Chemistry |
| **Course** | ~~Advanced Spectroscopy (4322/L)~~ | **Course** | Advanced Laboratory Applications of Spectroscopy (CHEM4323) |
| **Prerequisite** | CHEM3412, ~~CHEM3222~~ | **Prerequisite**  | CHEM2223, CHEM3312, CHEM3412, CHEM3622 |
| **Corequisite** |  | **Corequisite** |  |
| **Pre- or corequisite** |  | **Pre- or corequisite** |  |
| **Hours** | ~~Lecture 3 hr.; Lab 3 hr.~~ | **Hours** | Lab 4 hr. |
| **Credits** | ~~4~~ | **Credits** | 2 |
| **Description** | ~~This course begins with an overview of the quantum mechanical underpinnings of spectroscopy, the interaction of radiation with matter, and molecular symmetry. It then covers the general features of a spectroscopic experiment. The remainder of the course is devoted to detailed experimental and theoretical understanding of rotational, vibrational, and electronic spectroscopies, and an additional background in photoelectron and laser spectroscopies.~~ | **Description** | Guided high-level experimentation in research and industrial applications of spectroscopic techniques, grounded in the theoretical principles behind each technique, including Fourier-transform infrared (FTIR), nuclear magnetic resonance (NMR), UV-Vis, fluorescence, dynamic light scattering (DLS) and circular dichroism (CD) spectroscopies. Students create and conduct independent experimental designs from published scientific literature. |
| **Requirement Designation** | ~~Elective~~ | **Requirement Designation** | Required |
| **Liberal Arts** | [ ] Yes [ ] No  | **Liberal Arts** | [ ] Yes [ ] No  |
| **Course Attribute (e.g. Writing Intensive, Honors, etc** | Writing Intensive | **Course Attribute (e.g. Writing Intensive, Honors, etc** | Writing Intensive |
| **Course Applicability** | [x] Major[ ] Gen Ed Required[ ] English Composition[ ] Mathematics[ ] Science[ ] Gen Ed - Flexible[ ] World Cultures[ ] US Experience in its Diversity[ ] Creative Expression[ ] Individual and Society[ ] Scientific World[ ] Gen Ed - College Option[ ] Speech[ ] Interdisciplinary [ ] Advanced Liberal Arts | **Course Applicability** | [x] Major[ ] Gen Ed Required[ ] English Composition[ ] Mathematics[ ] Science[ ] Gen Ed - Flexible[ ] World Cultures[ ] US Experience in its Diversity[ ] Creative Expression[ ] Individual and Society[ ] Scientific World[ ] Gen Ed - College Option[ ] Speech[ ] Interdisciplinary [ ] Advanced Liberal Arts |
| **Effective Term** |  |  | **Fall 2019** |

**Rationale:** The proposed change will adapt CHEM4323 to better serve the needs of students, and to better fit the purpose of the Applied Chemistry program, by providing high-level experimentation and applied chemistry training in spectroscopic techniques. The name and the number of the course are updated to Advanced Laboratory Applications of Spectroscopy (CHEM4323) to better reflect its new content. CHEM4323 increases the number of pre-requisites with respect to CHEM4322, allowing the department to eliminate the lecture component since students have already been introduced to the fundamental principles of spectroscopic techniques in previous courses. CHEM4323 also strengthens the applied component by increasing the number of laboratory hours from 3 to 4. This proposal goes together with a minor curriculum change proposal to convert CHEM4323 from an elective course into a required course of the BS in Applied Chemistry, replacing the second Internship/Research in Applied Chemistry (CHEM4902), which will become an elective.

**New York City College of Technology**

**Department of Chemistry**

**Course Code:** CHEM 4323

**Title:** Advanced Laboratory Applications of Spectroscopy

**Number of Hours, Credits:** 2 credits, 4 hours of lab per week

**Course Description:** Guided high-level experimentation in research and industrial applications of spectroscopic techniques, grounded in the theoretical principles behind each technique, including Fourier-transform infrared (FTIR), nuclear magnetic resonance (NMR), UV-Vis, fluorescence, dynamic light scattering (DLS) and circular dichroism (CD) spectroscopies. Students create and conduct independent experimental designs from published scientific literature.

**Pre-requisites:** CHEM 2223, CHEM 3312, CHEM 3412, CHEM 3622

**Course Attributes:** Writing Intensive

**Course text:** Advanced Laboratory Applications of Spectroscopy. Laboratory Experiments – Chemistry Department, NYC College of Technology. Open Educational Resource (OER)

**Required Instructional Materials or Supplies:** safety goggles, laboratory coat, notebook

**Learning Outcomes and Assessment Methods**

*Discipline specific*

|  |  |
| --- | --- |
| **Learning outcomes**Upon completion of the course, students should be able to: | **Assessment** |
| Design and execute an experimental procedure from a research article or industrial protocol. | Laboratory practical assessed using the laboratory practical rubric |
| Independently operate a Fourier-transform infrared spectrometer, a nuclear magnetic resonance spectrophotometer, a UV-Vis spectrophotometer, a fluorescence spectrophotometer, a dynamic light scattering spectrophotometer, and a circular dichroism spectropolarimeter. | Laboratory practicalassessed using the laboratory practical rubric |
| Utilize computational techniques to transform raw spectroscopic data into clear and meaningful graphs.  | Laboratory reports |
| Draw reasonable conclusions from spectroscopic data. | Laboratory reports |

*General Education*

|  |  |
| --- | --- |
| **Learning outcomes**Upon completion of the course, students should be able to: | **Assessment** |
| Analyze and summarize data from discipline specific literature. | Laboratory reports  |
| Write clear and concise arguments based on analysis of data. | Laboratory reports |

**Course Outline:**

The following is a weekly guide to the spectroscopic techniques covered. The experiments will come from the scientific literature and may change depending on the semester.

|  |  |
| --- | --- |
| Week | Experiment  |
| 1 | **Check-in Introduction to Course; Lab Guidelines, Safety Protocol; Lab Report and Lab Notebook Overview.** |
| 2 | Antioxidant properties of food additives and food supplements by the DPPH assay (UV-Vis Spectroscopy) |
| 3 | Quantification of paracetamol in Tylenol and Generic tablets (UV-Vis Spectroscopy). *Part 1* |
| 4 | Quantification of paracetamol in Tylenol and Generic tablets (UV-Vis Spectroscopy). *Part 2* |
| 5 | Detection of protein amyloid aggregates by the ThT assay (Fluorescence Spectroscopy). *Part 1* |
| 6 | Detection of protein amyloid aggregates by the ThT assay (Fluorescence Spectroscopy). *Part 2* |
| 7 | Qualitative analysis of organic compounds with Fourier Transform (FTIR Spectroscopy). *Part 1* |
| 8 | Qualitative analysis of organic compounds with Fourier Transform (FTIR Spectroscopy). *Part 1* |
| 9 | Determination of secondary structure of human serum albumin and myoglobin (CD Spectroscopy) |
| 10 | Investigation of molecular fluxionality in allylpalladium complexes (NMR Spectroscopy)  |
| 11 | Introducing “Green” and “Nongreen” Aspects of Noble Metal Nanoparticle Synthesis (UV-Vis, Dynamic Light Scattering Spectroscopies). *Part 1* |
| 12 | Introducing “Green” and “Nongreen” Aspects of Noble Metal Nanoparticle Synthesis (UV-Vis, Dynamic Light Scattering Spectroscopies). *Part 2* |
| 13 | Identification of an unknown substance (NMR, UV-Vis, FTIR Spectroscopies). *Part 1*The choice of spectroscopic technique must be justified in your laboratory report |
| 14 | Identification of an unknown substance (NMR, UV-Vis, FTIR Spectroscopies). *Part 2*The choice of spectroscopic technique must be justified in your laboratory report |
| 15 | **Oral/Poster Presentations and Check-out** |

**Grading Policy and Procedure**

Laboratory: The activities and assignments comprising the laboratory grade will be:

 Written lab reports (50%) and lab notebook (10%): 60 %

Students will write one laboratory report for each of the laboratory exercises. Laboratory reports will follow the structure of scientific publications. The format includes the following sections: abstract, introduction, experimental procedures, results and discussion, conclusion and references.

Students will also be required to maintain a laboratory notebook that will be collected at the end of the semester.

Laboratory participation: 25 %

Students’ participation in lab is extremely important because laboratory techniques are learned by doing. Students must participate in a minimum of 13 of the 15 scheduled laboratory sessions in order to pass the course. Students will be evaluated on 1) active participation in the lab, 2) proper execution of laboratory techniques, and 3) compliance with safety procedures.

Oral Presentation: 15%

Students will be assigned one of the experiments performed during the semester to present the results in a group oral/poster presentation. The oral/poster presentation will be evaluated according to its structure, scientific content and clarity.

**Academic Integrity Policy Statement**

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.

**Technology Statement**

Before entering the course, students must be familiar with MS Word, MS Excel (simple spreadsheet calculations and graphing), and PowerPoint. During this course, students will learn how to convert between different data file types and how to import text file data into graphing software.

Minor Curriculum Change

**DESCRIPTION OF THE PROPOSAL**

This minor curriculum change proposal intends to replace the required second Internship/Research in Applied Chemistry course (CHEM4902) by the course Advanced Laboratory Applications of Spectroscopy (CHEM4323).

**RATIONALE OF THE PROPOSAL**

Spectroscopic techniques are extensively used in professional chemistry laboratories for a wide variety of applications. The current curriculum of the Applied Chemistry Bachelor of Science offers the course Advanced Spectroscopy (CHEM4322/L) only as an elective course, and therefore, many students graduate lacking a specific training in spectroscopic techniques. The proposed changes intend to better fit the needs of the students, as well as the purpose of the Applied Chemistry program, in providing a required advanced experimental course in spectroscopic techniques that are used in research and industrial laboratories. This course (Advanced Laboratory Applications of Spectroscopy, CHEM4323) is a modification of the existing elective CHEM4322/L, and will replace the required second internship (CHEM4902), which will become an elective.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **FROM:** | **Credits** | **TO:** | **Credits** |  |
| **GENERAL EDUCATION COMMON CORE 1 30-34 CREDITS** |  | **GENERAL EDUCATION COMMON CORE 1 30-34 CREDITS** |  |  |
| **I – REQUIRED CORE (4 COURSES, 13-14 CREDITS)** |  | **I – REQUIRED CORE (4 COURSES, 13-14 CREDITS)** |  |  |
| ENG 1101 | 3 | ENG 1101 | 3 |  |
| ENG 1121 | 3 | ENG 1121 | 3 |  |
| Mathematical and Quantitative Reasoning STEM math strongly recommended2 | 3-4 | Mathematical and Quantitative Reasoning STEM math strongly recommended2 | 3-4 |  |
| Life and Physical Sciences Recommended CHEM 1110 | 3-4 | Life and Physical Sciences Recommended CHEM 1110 | 3-4 |  |
| **II – FLEXIBLE CORE (6 COURSES, 18-20 CREDITS)** |   | **II – FLEXIBLE CORE (6 COURSES, 18-20 CREDITS)** |   |  |
| World Cultures and Global Issues | 3 | World Cultures and Global Issues | 3 |  |
| US Experience in its Diversity | 3 | US Experience in its Diversity | 3 |  |
| Individual and Society | 3 | Individual and Society | 3 |  |
| Creative Expression | 3 | Creative Expression | 3 |  |
| Scientific WorldSTEM math strongly recommended2 | 3-4 | Scientific WorldSTEM math strongly recommended2 | 3-4 |  |
| One Additional Course from Any GroupRecommended CHEM 1210 | 3-4 | One Additional Course from Any GroupRecommended CHEM 1210 | 3-4 |  |
|  |  |  |  |  |
| **TOTAL COMMON CORE CREDITS** | **30-34**  | **TOTAL COMMON CORE CREDITS** |  **30-34** |  |
| **COLLEGE OPTION** |  | **COLLEGE OPTION** |  |  |
| COM 1330 or higher3 | 3 | COM 1330 or higher3 | 3 |  |
| One interdisciplinary course liberal arts and science course | 3 | One interdisciplinary course liberal arts and science course | 3 |  |
| Two additional liberal arts courses to reach a minimum total of 42 credits in general education. In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language.  | 6 | Two additional liberal arts courses to reach a minimum total of 42 credits in general education. In meeting their general education requirements overall, students must take at least one advanced liberal arts course or two sequential courses in a foreign language.  | 6 |  |
|  |  |  |  |  |
| **TOTAL COLLEGE OPTION CREDITS** | **12** | **TOTAL COLLEGE OPTION CREDITS** | **12** |  |
| **PROGRAM-SPECIFIC DEGREE REQUIREMENTS (68-76)** |  | **PROGRAM-SPECIFIC DEGREE REQUIREMENTS (68-76)** |  |  |
| CHEM 1110 General Chemistry I  | 4 | CHEM 1110 General Chemistry I  | 4 |  |
| CHEM 1210 General Chemistry II  | 4 | CHEM 1210 General Chemistry II  | 4 |  |
| CHEM 2223 Organic Chemistry I  | 5 | CHEM 2223 Organic Chemistry I  | 5 |  |
| CHEM 2323 Organic Chemistry II  | 5 | CHEM 2323 Organic Chemistry II  | 5 |  |
| PHYS 1441 General Physics I: Calculus Based  | 5 | PHYS 1441 General Physics I: Calculus Based  | 5 |  |
| PHYS 1442 General Physics II: Calculus Based  | 5 | PHYS 1442 General Physics II: Calculus Based  | 5 |  |
| MAT 1475 2 Calculus I | 4 | MAT 1475 2 Calculus I | 4 |  |
| MAT 1575 Calculus II | 4 | MAT 1575 Calculus II | 4 |  |
| BIO 1101 General Biology I | 4 | BIO 1101 General Biology I | 4 |  |
| BIO 3601: Biochemistry  | 4 | BIO 3601: Biochemistry  | 4 |  |
| CHEM 3312: Analytical Chemistry  | 5 | CHEM 3312: Analytical Chemistry  | 5 |  |
| CHEM 3412: Instrumental Methods of Analysis | 5 | CHEM 3412: Instrumental Methods of Analysis | 5 |  |
| CHEM 3622: Inorganic Chemistry  | 4 | CHEM 3622: Inorganic Chemistry  | 4 |  |
| CHEM 3222: Physical Chemistry  | 4 | CHEM 3222: Physical Chemistry  | 4 |  |
| CHEM 4312: Instrumental Chromatography | 4 | CHEM 4312: Instrumental Chromatography | 4 |  |
| CHEM 4901: Internship/Research | 3 | CHEM 4901: Internship/Research | 3 |  |
| ~~CHEM 4902: Internship/Research~~ | ~~3~~ | CHEM 4323: Advanced Laboratory Applications of Spectroscopy | 2 |  |
| Science or Math electives to reach 120 credits4 | ~~4~~-10 | Science or Math electives to reach 120 credits4 | 5-10 |  |
| **TOTAL PROGRAM-SPECIFIC COURSES** | **68-76** | **TOTAL PROGRAM-SPECIFIC COURSES** | **68-76** |  |
| **TOTAL CREDITS REQUIRED FOR THE DEGREE**  | **120** | **TOTAL CREDITS REQUIRED FOR THE DEGREE**  | **120** |  |
| **SCIENCE/MATHEMATICS ELECTIVES4**Choose courses from the following list to bring total number of credits to 120. The choice of electives, to be made in close consultation with the Program Coordinator or Academic Advisor, should ideally reflect the student’s interests, post-baccalaureate study plans, and career goals. BIO 2311 Anatomy and Physiology I (Lecture and Laboratory) 4BIO 2312 Anatomy and Physiology II (Lecture and Laboratory) 4BIO 3302 Microbiology (Lecture and Laboratory) 4BIO 3350 Elements of Bioinformatics (Lecture and Laboratory) 4BIO 3352 Bioinformatics (Lecture and Laboratory) 4BIO 3354 Computational Genomics 3BIO 3356 Molecular Modeling in Biology 3BIO 3524 Nutrition 2BIO 3526 Pathophysiology 3BIO 3620 Molecular and Cell Biology (Lecture and Laboratory) 4CHEM 2411 Special Topics 3~~CHEM 4322/L: Advanced Spectroscopy 4~~CHEM 4822 Medicinal Chemistry 3CST 2403 Introductory C++ Programming Language Part I 3CST 3503 C++ Programming Part II 3MAT 2071 Introduction to Proofs and Logic 4MAT 2440 Discrete Structures and Algorithms I 3MAT 2540 Discrete Structures and Algorithms II 3MAT 2572 Probability and Mathematical Statistics I 4MAT 2580 Introduction to Linear Algebra 3MAT 25885 The Mathematics of Finance 3MAT 26305 Applied Mathematics Technology--Numerical Analysis 3MAT 2675 Calculus III 4MAT 2680 Differential Equations 3MAT 3021 Number Theory 4MAT 3050 Geometry I 4MAT 3075 Introduction to Real Analysis 4MAT 3080 Modern Algebra 4MAT 3672 Probability and Mathematical Statistics II 4MAT 37705 Mathematical Modeling I – Optimization 3MAT 3772 Stochastic Models 3MAT 3777 Applied Mathematics: Applications of theWave Equations 3MAT 37875 Applied Mathematics – Finite Fields 3MAT 37885 Applications of the Heat Equation forFinancial Mathematics 3MAT 3880 Introduction to Partial Differential Equations usingMathematical Models in Biology 3MAT 4030 History of Mathematics 3MAT 4050 Geometry II 3MAT 4672 Computational Statistics with Applications 3MAT 4788 Financial Risk Modeling 3MAT 4872 Probability and Mathematical Statistics III 4MAT 4880 Mathematical Modeling II 3PHYS 2601 Introduction to Research (Lecture and Laboratory) 3PHYS 2603L Physical Principles of Medical Imaging 3PHYS 2605 Introduction to Laser Physics and Photonics 4PHYS 2607 Introduction to Quantum Mechanics 3PHYS 2609 Introduction to Quantum Computing 4 |  | **SCIENCE/MATHEMATICS ELECTIVES4**Choose courses from the following list to bring total number of credits to 120. The choice of electives, to be made in close consultation with the Program Coordinator or Academic Advisor, should ideally reflect the student’s interests, post-baccalaureate study plans, and career goals. BIO 2311 Anatomy and Physiology I (Lecture and Laboratory) 4BIO 2312 Anatomy and Physiology II (Lecture and Laboratory) 4BIO 3302 Microbiology (Lecture and Laboratory) 4BIO 3350 Elements of Bioinformatics (Lecture and Laboratory) 4BIO 3352 Bioinformatics (Lecture and Laboratory) 4BIO 3354 Computational Genomics 3BIO 3356 Molecular Modeling in Biology 3BIO 3524 Nutrition 2BIO 3526 Pathophysiology 3BIO 3620 Molecular and Cell Biology (Lecture and Laboratory) 4CHEM 2411 Special Topics 3CHEM 4902: Internship/Research 3 CHEM 4822 Medicinal Chemistry 3CST 2403 Introductory C++ Programming Language Part I 3CST 3503 C++ Programming Part II 3MAT 2071 Introduction to Proofs and Logic 4MAT 2440 Discrete Structures and Algorithms I 3MAT 2540 Discrete Structures and Algorithms II 3MAT 2572 Probability and Mathematical Statistics I 4MAT 2580 Introduction to Linear Algebra 3MAT 25885 The Mathematics of Finance 3MAT 26305 Applied Mathematics Technology--Numerical Analysis 3MAT 2675 Calculus III 4MAT 2680 Differential Equations 3MAT 3021 Number Theory 4MAT 3050 Geometry I 4MAT 3075 Introduction to Real Analysis 4MAT 3080 Modern Algebra 4MAT 3672 Probability and Mathematical Statistics II 4MAT 37705 Mathematical Modeling I – Optimization 3MAT 3772 Stochastic Models 3MAT 3777 Applied Mathematics: Applications of theWave Equations 3MAT 37875 Applied Mathematics – Finite Fields 3MAT 37885 Applications of the Heat Equation forFinancial Mathematics 3MAT 3880 Introduction to Partial Differential Equations usingMathematical Models in Biology 3MAT 4030 History of Mathematics 3MAT 4050 Geometry II 3MAT 4672 Computational Statistics with Applications 3MAT 4788 Financial Risk Modeling 3MAT 4872 Probability and Mathematical Statistics III 4MAT 4880 Mathematical Modeling II 3PHYS 2601 Introduction to Research (Lecture and Laboratory) 3PHYS 2603 Physical Principles of Medical Imaging 3PHYS 2605 Introduction to Laser Physics and Photonics 4PHYS 2607 Introduction to Quantum Mechanics 3PHYS 2609 Introduction to Quantum Computing 4 |  |  |
| *1 Applied Chemistry is a STEM degree program, requiring 4 or 5 credit courses in mathematics and sciences. For purposes of advisement, specific courses recommended are “double-duty” courses: degree requirements that also meet CUNY Pathways general education requirements in that category. Students are not required to take these courses to meet their GenEd requirements; however, those who elect to use their required 4- or 5-credit math or science courses to meet general education requirements in Mathematical and Quantitative Reasoning, Life and Physical Sciences, and/or Scientific World will have up to 12 additional credits of science and math electives available.**2 The STEM math series is MAT 1275, MAT 1375, MAT 1475, MAT 1575, and MAT 2675, with each course a prerequisite for the next. Most courses in the sequence are included in the Math and Quantitative Reasoning and Scientific World categories. If initial placement determines that a student does not have the requisite math background to enter MAT 1475, they are required to take MAT 1275, and/or MAT 1375 in preparation. Students who elect not to take MAT 1275 and/or MAT 1375, if required, as part of their general education may need more than 120 credits to complete their degree.* *3 Students who have already met this requirement may choose any other liberal arts and science course in its place.**4 The number of science/math elective credits will vary depending upon the program-specific courses students use to meet Common Core requirements.**5 Students who wish to take MAT 2588 The Mathematics of Finance should be aware of the pre-and corequisites and arrange to take them as part of their flexible core and college option choices. Students who wish to take MAT 2630, MAT 3770,MAT 3787, or MAT 3788 should be aware of the prerequisite of CST 1101 and arrange to take it as part of their college option choices.* |   | *1 Applied Chemistry is a STEM degree program, requiring 4 or 5 credit courses in mathematics and sciences. For purposes of advisement, specific courses recommended are “double-duty” courses: degree requirements that also meet CUNY Pathways general education requirements in that category. Students are not required to take these courses to meet their GenEd requirements; however, those who elect to use their required 4- or 5-credit math or science courses to meet general education requirements in Mathematical and Quantitative Reasoning, Life and Physical Sciences, and/or Scientific World will have up to 12 additional credits of science and math electives available.**2 The STEM math series is MAT 1275, MAT 1375, MAT 1475, MAT 1575, and MAT 2675, with each course a prerequisite for the next. Most courses in the sequence are included in the Math and Quantitative Reasoning and Scientific World categories. If initial placement determines that a student does not have the requisite math background to enter MAT 1475, they are required to take MAT 1275, and/or MAT 1375 in preparation. Students who elect not to take MAT 1275 and/or MAT 1375, if required, as part of their general education may need more than 120 credits to complete their degree.* *3 Students who have already met this requirement may choose any other liberal arts and science course in its place.**4 The number of science/math elective credits will vary depending upon the program-specific courses students use to meet Common Core requirements.**5 Students who wish to take MAT 2588 The Mathematics of Finance should be aware of the pre-and corequisites and arrange to take them as part of their flexible core and college option choices. Students who wish to take MAT 2630, MAT 3770,MAT 3787, or MAT 3788 should be aware of the prerequisite of CST 1101 and arrange to take it as part of their college option choices.* |   |  |

**Evidence of department approval of the modification.**

Department of Chemistry

Faculty Meeting Minutes

December 6, 2018

1:06-2:04 pm in A518

In attendance: D. Samaroo, P. Spellane, T. Nicolas, A. Martinez, I. Jovanovic, L. Johnson

Excused: L.J. Deiner, S. Tewani

Prof. Samaroo called the meeting to order at 1:06 pm and discussion centered on the following:

1. Prof. Samaroo and Martinez presented for the second time two curriculum proposals. First proposal concerned a major curriculum change to modify credits, hours, course description, pre-requisites, course code, and course name of CHEM4322 (Advanced Spectroscopy). The department intends to convert this course from 3h lecture and 3h laboratory into a 4h laboratory course (renamed as CHEM4323, Advanced Laboratory Applications of Spectroscopy). As requested in the previous meeting (November 1,2018), the department was provided with a full proposal and a full specific outline of the modified course including description, learning goals, and list of experiments, among other information. The second proposal concerned a minor curriculum change on the BS in Applied Chemistry to convert CHEM4323 (Advanced Laboratory Applications of Spectroscopy) from elective to program specific required course, by replacing the second internship CHEM4902 (which would then become an elective). The department discussed both proposals and voted on them. Results of the voting were as follows:

**In favor of proposal Against proposal Abstained**

**Major and minor curriculum changes 5 1 0**

As a result, the proposed changes received department approval (with only minor language corrections) and will be forwarded to the Dean and subsequently to the curriculum committee of college council.

Note: Prof. S. Tewani, absent, had left his vote in a sealed envelope that was only opened the day of the voting.

1. Chemistry Department Grade Appeals Committee was elected. Profs. Nicolas, Spellane and Martinez will serve in such committee.
2. Prof. Samaroo reminded members of the Department Appointments Committee the date of the next meeting: January 22nd, 2019.
3. Prof. Samaroo updated the department about funds raised during giving Tuesday. Chemistry Department: $318; City Tech: $61,327.98
4. Profs. Nicolas volunteered to represent the Chemistry Department in the College Transfer Committee.
5. Ms. Lois Johnson and Prof. Samaroo updated the department with the status of teaching and research laboratories. To highlight, the department unanimously agreed to explore trade-in options for some Shimadzu instruments: EDX and XRD, due to no longer supported software and hardware components; as well as one of the GC chromatographs, due to expired license.
6. Profs. Martinez and Nicolas updated the department on the status of the Bruker 300 MHz and Anasazi 90 MHz spectrophotometers repair.
7. Department Holiday Season party was announced to be on December 20, 2018.

Meeting was called to an end at 2:04 pm.

Minutes submitted by Alberto Martinez

**Oral Presentation Rubric for CHEM 4323**

**Student Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CATEGORY | **1** | **2** | **3** | **4** | **TOTAL** |
| **Organization** | Presentation is not understandable, since there is no sequence of information | There is difficulty following presentation since students jumps around from point to point | Student presents information in a logical sequence. Presentation is easily followed | Student presents information in a logical, interesting manner, which can be easily followed |  |
| **Subject Knowledge** | Student does not have grasp of information; cannot answer questions about research project | Student is uncomfortable with information and is able to answer only basic questions | Student is at ease with expected answers to all questions, but does not elaborate | Student demonstrates more than required knowledge by addressing questions with explanations and elaboration |  |
| **Graphics/Style** | Student uses superfluous graphics or no graphics | Student occasionally uses graphics that rarely support text and presentation | Student’s graphics relate to text and presentation | Student’s graphics explain and reinforces text and presentation |  |
| **Syntax** |  | Student’s presentation has multiple spelling and/or grammatical errors |  | Student’s presentation has no (or minimal) spelling and/or grammatical errors |  |
| **Eye Contact** | Student reads 100% of the report with no eye contact during presentation | Students occasionally uses eye contact, but still reads most of report during presentation | Student maintains eye contact most of the time but frequently returns to notes during presentation | Student maintains eye contact, seldom returns to notes during presentation |  |
| **Elocution** | Student speaks somewhat distinctly most of the time; mispronounces several words; mumbles or speaks too quietly to be heard | Student speaks clearly and distinctly most of the time. Mispronounces more than one word but no more than 4 words; voice is low; difficulty hearing presentation | Student speaks clearly and distinctly all the time, but mispronounces one or two words’ can be heard during presentation | Student speaks clearly and distinctly all the time, and mispronounces no words. Can be easily heard during presentation |  |
| **Total points (sum of points from the six categories /1.6)****Maximum points: 15** **Comments/notes** |  |

**Laboratory Participation and Practical Rubric for CHEM 4323**

**Student Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CATEGORY | **1** | **3** | **5** | **TOTAL** |
| **Class Engagement** | Student is barely engaged in the laboratory activities and does not show interest. Student is consistently late to most of the laboratory meetings. | Student is mostly engaged but shows lack of interest in two or three laboratory experiments. Student is late to two or three laboratory meetings. | Student is clearly focused and actively participates in all scheduled laboratory meetings. Student is on time to all laboratory meetings. |  |
| **Laboratory Techniques** | Student does not apply the proper laboratory methodology during most of the semester | Student mostly follows the proper laboratory methodology, but makes mistakes in the execution of experiments in more than one laboratory experiment | Student demonstrates excellent laboratory techniques in all performed experiments  |  |
| **Safety** | Student barely follows basic safety procedures and endangers the rest of students in the lab | Student fails to accurately follow safety protocols in more than one laboratory experiment | Student complies with all safety rules and protocols adequately |  |
|  | **Total points (sum of points from the three categories x 1.7)****Maximum points: 25** **Comments/notes** |  |