***NEW COURSE PROPOSAL***

*Spring 2020*

“**CST2412** **Data Security, Privacy and Ethics"**

Respectfullysubmitted to College Council Curriculum Committee *by:*

Prof. Yu-Wen Chen, Computer Systems Technology Department

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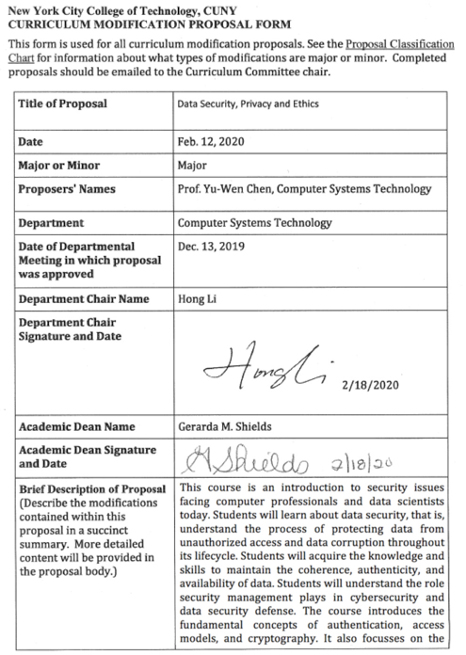
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| **Brief Description of Proposal**  (Describe the modifications contained within this proposal in a succinct summary. More detailed content will be provided in the proposal body.) | data-related security issues from the web, network, cloud computing, and databases. This course will also cover how data analytics can be used effectively against the new threats in information. The course will exercise the privacy, legal, ethical and social concerns that arise with big data. Students will exercise how to read about privacy policies, protect their privacy, and handle data ethically. |
| **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 new course (Data Security, Privacy and Ethics) in this proposal is the first security course for students in the Bachelor of Science in Data Science at City Tech. It is necessary and important for Data Science students to acquire the knowledge and skills on how to maintain the coherence, authenticity, and availability of data. This course will address the privacy, legal and ethical concerns that arise with big data and recognize the role security management plays in cyber security and data security defense. It is also beneficial to teach students how to utilize and apply data analytics in the cyber security field. |
| **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.   * Submitted on 02/20/2020 * Revised and resubmitted on 06/08/2020, 09/22/2020 and 10/14/2020 |

**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** | *New Course:* Data Security, Privacy and Ethics |
| **Proposal Date** | Feb. 10, 2020 |
| **Proposers' Names** | Prof. Yu-Wen Chen, Computer Systems Technology |
| **Course Number** | CST 2412 |
| **Course Credits, Hours** | 3 credits; 2 lecture hours and 2 lab hours |
| **Course Pre-requisites** | CST 2402 |
| **Catalog Course Description** | This course is an introduction to security issues that computer professionals and data scientists face today. Course topics focus on the privacy, legal, ethical and social concerns that arise with the processing and management of big data. These include data security, protection against data corruption, and the role security management plays in cybersecurity and data security defense. The course prepares to students to interpret privacy policies, protect data privacy and manage data ethically. |
| **Brief Rationale**  Provide a concise summary of why this course is important to the department, school or college. | Data Security, Privacy and Ethics is the first security course for students in the Bachelor of Science in Data Science at City Tech. It is necessary and important for Data Science students to acquire the knowledge and skills on how to maintain the coherence, authenticity, and availability of data. This course equips students and computing professionals with the basic information and data security knowledge and teaches them how to utilize data analytics to implement and maintain modern information infrastructure and systems. |
| **CUNY – Course Equivalencies**  Provide information about equivalent courses within CUNY, if any. | No equivalents within CUNY, to our knowledge. Related, but not duplicative, courses at CUNY-Queensborough Community College is CIS-254 (Data Security for Business).  Related, but not duplicative, courses offered in other institutions around the country: at University of Pennsylvania is LGST642x (Big Data, Big Responsibilities: The Law and Ethics of Business Analytics); at Brandeis University in Massachusetts is RSAN177 (Data Security, Privacy, and Ethics). Possibly other institutions around the country. |
| **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. | Not applicable. |
| **For Interdisciplinary Courses:**   * Date submitted to ID Committee for review * Date ID recommendation received   - Will all sections be offered as ID? Y/N | Pending outcome of this proposal. |
|  |
| No. |
| **Intent to Submit as a Writing Intensive Course** | No. |

**NEW COURSE PROPOSAL CHECK LIST**

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

|  |  |
| --- | --- |
| **Completed NEW COURSE PROPOSAL FORM** |  |
| * Title, Number, Credits, Hours, Catalog course description | X |
| * Brief Rationale | X |
| * CUNY – Course Equivalencies | X |
| Completed [Library Resources and Information Literacy Form](http://openlab.citytech.cuny.edu/collegecouncil/files/2014/08/curriculum_modification_library_form.doc) | X |
| **Course Outline**  Include within the outline the following. | **X** |
| Hours and Credits for Lecture and Labs  If hours exceed mandated Carnegie Hours, then rationale for this | X |
| Prerequisites/Co- requisites | X |
| Detailed Course Description | X |
| Course Specific Learning Outcome and Assessment Tables   * Discipline Specific * General Education Specific Learning Outcome and Assessment Tables | X |
| Example Weekly Course outline | X |
| Grade Policy and Procedure | X |
| Recommended Instructional Materials (Textbooks, lab supplies, etc) | X |
| Library resources and bibliography | X |
| **Course Need Assessment.**  Describe the need for this course. Include in your statement the following information. | X |
| 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). | X |
| Projected headcounts (fall/spring and day/evening) for each new or modified course. | X |
| 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. | X |
| Where does this course overlap with other courses, both within and outside of the department? | X |
| Does the Department currently have full time faculty qualified to teach this course? If not, then what plans are there to cover this? | X |
| 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. | X |
| Course Context (e.g. required, elective, capstone) | X |
| Course Structure: how the course will be offered (e.g. lecture, seminar, tutorial, fieldtrip)? | X |
| Anticipated pedagogical strategies and instructional design (e.g. Group Work, Case Study, Team Project, Lecture) | X |
| How does this course support Programmatic Learning Outcomes? | X |
| Is this course designed to be partially or fully online? If so, describe how this benefits students and/or program. | X |
| **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 |
| Interdisciplinary Committee Recommendation (if applicable and if received)\*  \*Recommendation must be received before consideration by full Curriculum Committee | 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). |  |
| Established Timeline for Curricular Experiment |  |

**LIBRARY RESOURCES & INFORMATION LITERACY: MAJOR CURRICULUM MODIFICATION**

Please complete for **all** major curriculum modifications. This information will assist the library in planning for new courses/programs.

Consult with your library faculty subject specialist (<http://cityte.ch/dir>) **3 weeks before the proposal deadline**.

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

|  |  |  |
| --- | --- | --- |
| **1** | **Title of proposal**  CST 2412 – Data Security, Privacy and Ethics | **Department/Program**  Computer Systems Technology / BS in Data Science |
|  | **Proposed by** (include email & phone)  Dr. Yu-Wen Chen  [YWChen@citytech.cuny.edu](mailto:YWChen@citytech.cuny.edu)  718-260-5325 | **Expected date course(s) will be offered**  Spring 2021  **# of students:** 24 |

|  |  |
| --- | --- |
| **2** | **The library cannot purchase reserve textbooks for every course at the college, nor copies for all students. Consult our website (**[**http://cityte.ch/curriculum**](http://cityte.ch/curriculum)**) for articles and ebooks for your courses, or our open educational resources (OER) guide (**[**http://cityte.ch/oer**](http://cityte.ch/oer)**). Have you considered using a freely-available OER or an open textbook in this course?**  Yes. Conference and journal articles from the digital library will be used for this course. I am also constantly looking for suitable OER materials. The “Computer System Security” from the MIT Open Courseware is one of the potential resources. |

|  |  |
| --- | --- |
| **3** | **Beyond the required course materials, are City Tech library resources sufficient for course assignments? If additional resources are needed, please provide format details (e.g. ebook, journal, DVD, etc.), full citation (author, title, publisher, edition, date), price, and product link.**  Yes, City Tech Library resources are sufficient for the proposed course assignments because the main readings for the course are a required textbook and journal articles that will be assigned by instructor. Students should be able to locate the selected journal articles in library. |

|  |  |
| --- | --- |
| **4** | **Library faculty focus on strengthening students' information literacy skills in finding, critically evaluating, and ethically using information. We collaborate on developing assignments and customized instruction and research guides. When this course is offered, how do you plan to consult with the library faculty subject specialist for your area? Please elaborate.**  I will reach out to the library subject specialist via email to arrange an information session in which the library subject specialist can present to the students of this course, the use of library databases, citation convention and discuss copyright issues. |

|  |  |
| --- | --- |
| **5** | **Library Faculty Subject Specialist Prof. Junior Tidal**  **Comments and Recommendations**  After surveying the collection, I believe that the library can adequately support this course. Upon course approval, I recommend that the library acquires print monographs related to cyber security and machine learning. It may also be beneficial to students to have access to films and specific journals as well.  **Date: 02.13.2020** |

**Course Outline**

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

**Computer Systems Technology Department**

**CST 2412 – Data Security, Privacy and Ethics (2 Lecture hours, 2 lab hours, 3 credits)**

# **Course Description:** This course is an introduction to security issues that computer professionals and data scientists face today. Students will learn about data security, the process of protecting data from unauthorized access, and data corruption throughout its lifecycle. Students will acquire the knowledge and skills to maintain the coherence, authenticity, and availability of data. Students will study the role security management plays in cybersecurity and data security defense. The course introduces the fundamental concepts of authentication, access models, and cryptography. It focuses on data-related security issues from the web, network, cloud computing, and databases. This course will also address how data analytics can be used effectively against emerging threats in information security. The course will discuss the privacy, legal, ethical and social concerns that arise with the processing and management of big data. Students will exercise how to read privacy policies, protect their privacy, and manage data ethically.

**Objective:** This is the first security course in the data science program at City Tech. It equips students and computing professionals with the basic information and data security knowledge and teaches them how to utilize data analytics to implement and maintain modern information infrastructure and systems.

**Intended learning outcomes:** what students will know or be able to do at the end of this course:

|  |  |
| --- | --- |
| **Course-specific outcomes** | **Assessment methods** |
| * Demonstrate knowledge of the broad set of technical, social & political aspects of information security and data security. * Demonstrate an understanding of how to maintain and protect the coherence, authenticity, availability of the data. | * Quizzes * Assignments * Certificate * Participation * Term Project * Exams |
| * Demonstrate an understanding of the vulnerabilities and threats posed by cybercrime, terrorism and nation states to national infrastructure. * Demonstrate an understanding of the risks and   vulnerabilities associated with information and data. | * Quizzes * Assignments * Certificate * Participation * Exams |
| * Demonstrate an understanding of the secure designs for data base and the web user data. * Demonstrate an understanding of the role security management plays in information security and data security defense. | * Quizzes * Assignments * Participation * Exams |
| * Demonstrate knowledge of the legal, ethical and social issues at play in developing solutions. | * Quizzes * Assignments * Participation * Exams |
| * Demonstrate the ability of protecting privacy by using cryptography and applying data analytics for security. | * Quizzes * Term Project * Assignments * Certificate * Participation * Exams |

**General Education Learning Outcomes / Assessment Methods**



|  |  |
| --- | --- |
| **Learning Outcomes** | **Assessment Methods** |
| 1. Demonstrate the ability to work collaboratively and independently on assignments in and outside a classroom setting. | * Classroom discussions, * Assignments * Term project oral presentation |
| 1. Understand and employ both quantitative and qualitative analysis to solve problems. | * Classroom discussion * Group in-class activities * Term project presentations * Quizzes * Exams |
| 1. Develop reading, writing competencies, and listening skills. | * Writing assignments (Each assignment requires writing) * Term project report * Classroom discussion. |
| 1. Work with teams. Build consensus. Use creativity. | * Term project and presentation |

**Prerequisites**: CST2402 Introduction to Data Science

**Required textbook**:

Charles P. Pfleeger, Shari Lawrence Pfleeger, Jonathan Margulies*, Security in Computing,* 5th edition, Published by Pearson (January 26th 2015) - Copyright © 2015, ISBN-13: 978-0134085043

Materials from journal articles, latest news, and book chapters will be used throughout the course. Please see examples in the sections of weekly schedule and the selected materials parts.

**Homework/Labs Assignments:** Homework/Labs assignments will be based on chapter questions and other selected practices. See sample Assignments in Appendix II.

# **Term Project:**

# The term project requires student to conduct a thoughtful study on the specific course related topic (selected by students and approved by the instructor). Students need to present in class with PowerPoint slides for 15 minutes and submit a formal project report at the end of the semester.

**On-line Certificate:**

Students are required to complete the certificate “AWR173 Information Security Basics” offered by the TEEX. The URL for registering the on-line certificate: <https://teex.org/Pages/Program.aspx?catID=607&courseTitle=Cybersecurity>

**Grade Requirement:**

Students must complete all project assignments, homework assignments, participate in all tests.

**Course grading formula:**

Assignments 15%

Term project 20%

Quizzes & Participation 10%

On-line Certificate 15%

Midterm Exam 20%

Final Exam 20%

100%

**Grading Policy:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Letter Grade** | **A** | **A-** | **B+** | **B** | **B-** | **C+** | **C** | **D** | **F** |
| **Numeric Grade** | **93-100** | **90-92.9** | **87-89.9** | **83-86.9** | **80-82.9** | **77-79.9** | **70-76.9** | **60-69.9** | **59 and below** |

**Progression Requirements:**

Students majoring in CST must earn a grade of “C” or better in this course.

**Topics and Schedule:**

|  |  |  |
| --- | --- | --- |
| **Week** | **Topics** | **Readings** |
| **1** | Introduction to information Security | Chapter 1 |
| **2-3** | Authentication, Access Control, and Cryptography | Chapter 2 |
| **4** | The Web – user side | Chapter 4 |
| **5** | Background for the Network and Network security | Chapter 6 |
| **6** | Security in the Databases, Cloud computing and Big Data | Chapter 7, Chapter 8 and selected reading  (See the item 1 in the Selected reference books and sites below) |
| **7** | Review & Midterm |  |
| **8** | Privacy | Chapter 9 and selected reading  (See the item 2, 3, 4, and 5 in the Selected reference books and sites below) |
| **9** | Legal issues and Ethics | Chapter 11 |
| **10** | Management and Incidents | Chapter 10 |
| **11-12** | Data Analytics for Security | Selected reading  (See the item 6, 7 in the Selected reference books and sites below) |
| **13-14** | Data Poisoning and Model Evasion | Selected reading  (See the item 8, 9 and 10 in the Selected reference books and sites below) |
| **15** | Review & Final Exam |  |

**Selected materials:**

1. Mayer-Schonberger and Cukier 2013 *Big Data: A Revolution that Will Transform - How We Live, Work, and Think*
2. Facebook–Cambridge Analytica data scandal. <https://en.wikipedia.org/wiki/Facebook%E2%80%93Cambridge_Analytica_data_scandal>
3. "Facebook/Cambridge Analytica data scandal shines spotlight on trust." Information Management [web content] 22 Mar. 2018. Business Insights: Global. Web. 7 June 2020.
4. Video from <https://www.nytimes.com/2018/04/08/us/facebook-users-data-harvested-cambridge-analytica.html>
5. Video from <http://www.bbc.com/news/technology-43698733>
6. Tom Mitchell, *Machine Learning*, McGraw-Hill, 1997
7. Wenke Lee and Sal Stolfo. [A Framework for Constructing Features and Models for Intrusion Detection Systems](http://wenke.gtisc.gatech.edu/papers/ids_framework.ps) Wenke Lee and Sal Stolfo. ACM Transactions on Information and System Security, 3(4), November 2000.
8. Ke Wang and Sal Stolfo. Anomalous Payload-based Network Intrusion Detection. In Proceedings of International Symposium on Recent Advances in Intrusion Detection, 2005. <https://pdfs.semanticscholar.org/c441/1d48c00924f7ebc57d4e7ebaa8d2f23c973e.pdf>
9. Prahlad Fogla, Monirul Sharif, Roberto Perdisci, Oleg Kolesnikov, and Wenke Lee. Polymorphic Blending Attacks. In Proceedings of the USENIX Security Symposium, 2006. <https://www.usenix.org/legacy/event/sec06/tech/full_papers/fogla/fogla_html/main.html>
10. Roberto Perdisci, David Dagon, Wenke Lee, Prahlad Fogla, and Monirul Sharif. Misleading Worm Signature Generators Using Deliberate Noise Injection. In Proceedings of the IEEE Symposium on Security and Privacy, 2006. <http://www.cc.gatech.edu/home/wenke/papers/ieee-sp-06.pdf>

**New York City College of Technology Policy on 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.

New York City College of Technology, like all academic institutions, encourages and thrives on the open exchange of ideas. At City Tech, we expect everyone to conduct their intellectual work with honesty and integrity. With this goal in mind, and in response to the Report of the CUNY Committee on Academic Integrity (<http://web.cuny.edu/academics/info-central/policies/academic-integrity-report.pdf>) the NYCCT College Council approved a new academic integrity policy in May 2007. City Tech's academic integrity policy aims to deter academic dishonesty by students and allow the college to process cases of academic dishonesty more effectively. This policy has been in effect as of August 27, 2008.

**Accessibility Statement:**

Accessibility Statement City Tech is committed to supporting the educational goals of enrolled students with disabilities in the areas of enrollment, academic advisement, tutoring, assistive technologies, and testing accommodations. If you have or think you may have a disability, you may be eligible for reasonable accommodations or academic adjustments as provided under applicable federal, state, and/or city laws. You may also request services for temporary conditions or medical issues under certain circumstances. If you have questions about your eligibility and/or would like to seek accommodation services and/or academic adjustments, please contact the Student Accessibility Center (SAC) at 300 Jay Street. Room L-237; telephone: 718-260-5143; WWW: http://www.citytech.cuny.edu/accessibility/.

**City Tech Computer Systems Technology Department Commitment to Student Diversity:**

The Computer Systems Technology Department complies with the college-wide nondiscrimination policy and seeks to foster a safe and inclusive learning environment that celebrates diversity in its many forms and enhances our students’ ability to be informed, global citizens.

**Course Need**

**Students who would take this class:** students who intend to major in Data Science

**Department**: Computer Systems Technology

**Program**: Bachelor of Science in Data Science at City Tech

**The number of section (s) anticipated:** one section for the first year

**Projected headcount:** 24 students

**Physical Resources required:** Basicsmartroomset**-**up**:** a screen, and an overhead projector/a TV set that is run by and connected to a computer

**Course overlap:** None

**Faculty** **qualified** **for** **teaching** **this** **course**: Yes, there are faculty members who have doctoral degrees in Computer Science with the concentration in Information Security and Data Analytic for various domains.

**Course Design**

**Course context:** This course will be required of Data Science major students. Students are required to develop an independent project at the end of the semester.

**Course** **structure**: This course will be offered in a lecture style/format.

**Anticipated** **Pedagogical** **Strategies** **and** **Instructional** **Design**: This class will be run in a lecture-activity style/format. The class will start with a lecture, and involve the in-class activities, such as group discussion, hands-on exercises (examples: calculating the risk and determining the preferred defense strategies) and hands-on labs (examples: cryptography tools).

**Providing Support to Programmatic Learning Outcomes:** This course requires satisfactory completion of individual assignments, quizzes, on-line certificate, exams and the final group project.

**Is this course designed to be partially or fully online? If so, describe how this benefits students and/or program.** Not online; all in-person.

**Rationale:**

With increasing amounts of data being generated and linked to each of us on the Internet and the various social media platforms, it is becoming increasingly important to learn about data security, that is, to understand the process of protecting data from unauthorized access and data corruption throughout its lifecycle. The unauthorized access of data can violate the user’s privacy and the compromised data can cause several potential threats such as identity theft\*1 and misinformation\*2.

The proposed course (CST 2412: Data Security, Privacy, and Ethics) is the first security course for students in the Bachelor of Science in Data Science program at City Tech. As indicated in the Changes in Degree Program form below, CST 2412 will replace CST2410. This allows BS in Data Science students take CST2412 without the pre-requisite course limitation from CST2410, which requires CST 2307. It is specifically designed to address security, privacy and ethics in the data science domain.

This course is an introduction to security issues that computer professionals and data scientists face today. Students will learn about data security. Students will acquire the knowledge and skills to maintain the coherence, authenticity, and availability of data. The course introduces the fundamental concepts of authentication, access models, and cryptography. It focuses on data-related security issues from the web, network, cloud computing, and databases. This course will also address how data analytics can be used effectively against emerging threats in information security. The course will discuss the privacy, legal, ethical and social concerns that arise with the processing and management of big data. Students will exercise how to read privacy policies, protect their privacy, and manage data ethically.

Students will recognize the role security management plays in cybersecurity and data security defense and will be able to apply the data analytic skills in the cybersecurity field, which are the recently emerged in the job field as “Data Security Analyst\*3”. The proposed course also strengthens students’ skills by requiring the “Information Security Basics” certificate, which would be beneficial for their professional experience.

When applying data analytics on top of various data sets, it is critically important to educate students about how to handle and use the data legally and ethically. Privacy has become a particularly significant concern across multiple social media platforms. The proposed course will address the privacy, legal, ethical and social concerns that arise with big data, such as the Facebook–Cambridge Analytica data scandal\*4. The course will cover the laws and agencies that are securing data. The course will teach students the various types of data collected and used by major social media platforms. Students will be aware of the necessary information in the privacy policy from various sites/companies and learn how to protect their privacy.

The proposed course is an essential course for the road map in the Bachelor of Science in Data Science program at City Tech. It will provide valuable resources and tools from administrative, professional, and ethical perspectives that will benefit students on multiple levels.

\*1 Identity Theft: <https://www.consumer.ftc.gov/features/feature-0014-identity-theft>

\*2 References regarding misinformation and the concept of “Fake News”:

* Allcott, Hunt, and Matthew Gentzkow. 2017. "Social Media and Fake News in the 2016 Election." Journal of Economic Perspectives, 31 (2): 211-36.DOI: 10.1257/jep.31.2.211, URL: <https://www.aeaweb.org/articles?id=10.1257/jep.31.2.211>
* Kai Shu, Amy Sliva, Suhang Wang, Jiliang Tang, and Huan Liu. 2017. Fake News Detection on Social Media: A Data Mining Perspective. SIGKDD Explor. Newsl. 19, 1 (June 2017), 22–36. DOI:https://doi.org/10.1145/3137597.3137600

\*3 References for the Data Security Analyst Jobs:

* Data Security Analyst: Job Description, Duties and Requirements

<https://study.com/articles/Data_Security_Analyst_Job_Description_Duties_and_Requirements.html>

# Data Security Analyst Job Description

# <https://www.jobhero.com/data-security-analyst-job-description/>

# Data Security Analyst Salaries

<https://www.glassdoor.com/Salaries/data-security-analyst-salary-SRCH_KO0,21.htm>

\*4 References for Facebook–Cambridge Analytica data scandal:

* Facebook–Cambridge Analytica data scandal <https://en.wikipedia.org/wiki/Facebook%E2%80%93Cambridge_Analytica_data_scandal>
* "Facebook/Cambridge Analytica data scandal shines spotlight on trust." Information Management [web content] 22 Mar. 2018. Business Insights: Global. Web. 7 June 2020.
* Video from <https://www.nytimes.com/2018/04/08/us/facebook-users-data-harvested-cambridge-analytica.html>
* Video from <http://www.bbc.com/news/technology-43698733>

**CHANCELLOR'S REPORT FORM**

***NEW COURSE PROPOSAL:* "Data Security, Privacy and Ethics"**

|  |  |
| --- | --- |
| **Department(s)** | Computer Systems Technology |
| **Academic Level** | **[ X ] Regular  [   ] Compensatory  [   ] Developmental  [   ] Remedial** |
| **Subject Area** | Data Science |
| **Course Prefix** | CST |
| **Course No.** | CST 2412 |
| **Course Title** | Data Security, Privacy and Ethics |
| **Catalog Description** | An introduction to security issues that computer professionals and data scientists face today. Topics focus on the privacy, legal, ethical and social concerns that arise with the processing and management of big data: from data security, to how to protect against data corruption, to the role security management plays in cybersecurity and data security defense. Includes practice in how to read privacy policies, protect data privacy and manage data ethically. |
| **Prerequisites** | CST 2402 Introduction to Data Science |
| **Credits** | 3 |
| **Contact Hours** | 4 (2 lecture and 2 lab hours) |
| **Liberal Arts** | [ ] Yes  **[X]** No |
| **Course Attribute** | **It is not a writing intensive course** |
| **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 [ ] Creative Expression [ ] Advanced Liberal Arts [ ] Science [ ] Individual and Society [ ] Scientific World** |
| **Effective Term** | **Spring 2021** |

**Section AIII: Changes in Degree Programs**

**The following revisions are proposed for the Bachelor of Science in Data Science**

**Program: Bachelor of Science in Data Science**

**Program Code: 40402**

**Effective Date: Fall 2021**

|  |  |
| --- | --- |
| **FROM:** | **TO:** |
| **Program-Specific Degree Requirements (60/61 credits)**  **Major Core (54 credits)**  CST1100 Introduction to Computer Systems 3  CST1101 Problem Solving with Computer Programming 3  CST1201 Programming Fundamentals 3  CST1204 Databased Fundamentals 3  CST2312 Information and Data Management I 3  CST2309 Web Programming I 3  CST2402 Introduction to Data Science 3  ~~CST2410 Introduction to Computer Security 3~~  CST3512 Information and Data Management II 3  CST3502 Data Mining 3  CST3513 Object Oriented Programming 3  CST3602 Data Visualization 3  CST3650 Data Structures 3  CST4702 Machine Learning Fundamentals 3  CST4714 Database Administration 3  CST4802 Information Retrieval 3  CST4812 Natural Language Processing 3  CST4900 Internship3  **Major electives (take any 2 courses) (6/7 credits)**  BUS2339 Financial management 3  BUS2341 Financial Forecasting 3  ECON1101 Macroeconomics 3  ECON2301 Money and Banking 3  MED2400 Medical Informatics Fundamentals 3  MED4229 Healthcare Databases 3  BMET4741 Fundamental Healthcare Data Analytics 3  BMET4842 Advanced Healthcare Data Analytics 3  CET4925 Internet of Things 3  CET4973 Introduction to Artificial Intelligence 3  MAT3672 Probability and Statistics II 3  MAT4672 Computational Statistics with Applications 4  PHYS3600 Machine Learning for Physics and Astronomy 3 | **Program-Specific Degree Requirements (60/61 credits)**  **Major Core (54 credits)**  CST1100 Introduction to Computer Systems 3  CST1101 Problem Solving with Computer Programming 3  CST1201 Programming Fundamentals 3  CST1204 Databased Fundamentals 3  CST2312 Information and Data Management I 3  CST2309 Web Programming I 3  CST2402 Introduction to Data Science 3  CST2412 Data Security, Privacy and Ethics 3  CST3512 Information and Data Management II 3  CST3502 Data Mining 3  CST3513 Object Oriented Programming 3  CST3602 Data Visualization 3  CST3650 Data Structures 3  CST4702 Machine Learning Fundamentals 3  CST4714 Database Administration 3  CST4802 Information Retrieval 3  CST4812 Natural Language Processing 3  CST4900 Internship3  **Major electives (take any 2 courses) (6/7 credits)**  BUS2339 Financial management 3  BUS2341 Financial Forecasting 3  ECON1101 Macroeconomics 3  ECON2301 Money and Banking 3  MED2400 Medical Informatics Fundamentals 3  MED4229 Healthcare Databases 3  BMET4741 Fundamental Healthcare Data Analytics 3  BMET4842 Advanced Healthcare Data Analytics 3  CET4925 Internet of Things 3  CET4973 Introduction to Artificial Intelligence 3  MAT3672 Probability and Statistics II 3  MAT4672 Computational Statistics with Applications 4  PHYS3600 Machine Learning for Physics and Astronomy 3 |

**Rationale:** Replace CST2410 to CST2412. This allows BS in Data Science students take CST2412 without the pre-requisite course limitation from CST2410 (which requires CST 2307). Also, this course is specifically designed to address security, privacy and ethics in the data science domain.

**Appendix I – Supporting Emails**

Supporting Emails from the Chair and other faculty in CST department:

* Dr. Hong Li

[HLi@citytech.cuny.edu](mailto:HLi@citytech.cuny.edu)

* Dr. Ashwin Satyanarayana

[ASatyanarayana@citytech.cuny.edu](mailto:ASatyanarayana@citytech.cuny.edu)

* Dr. Candido Cabo

[CCabo@citytech.cuny.edu](mailto:CCabo@citytech.cuny.edu)

**Appendix II – Assignment Examples**

**Example 1:**

1. (10 points) What information attribute is often of great value for local networks that use static addressing?
2. (10 points) What’s the difference between an asset’s ability to generate revenue and its ability to generate profit?

1. (15 points) What is competitive disadvantage? Why has it emerged as a factor?
2. (15 points) Using the data classification scheme in this chapter, identify and classify the information in your personal computer or personal digital assistant. Based on the potential for misuse or embarrassment, what information would be confidential, sensitive but unclassified, or for public release?
3. (15 points) Please calculate the weighted scores for the asset 1 and asset 2. Which asset is more important?

|  |  |  |
| --- | --- | --- |
| Information Asset | Criterion 1 | Criterion 2 |
| Criterion weight | **70** | **30** |
| Asset 1 | **0.5** | **0.9** |
| Asset 2 | **0.7** | **0.8** |

1. (10 points) Suppose XYZ Software Company has a new application development project. Using the following table, calculate the **Annual Rate of Occurrence** **(ARO)** and **Annualized Loss Expectancy (ALE)** for each threat category the company faces for this project.

|  |  |  |
| --- | --- | --- |
| **Threat Category** | **Cost per Incident (SLE)** | **Frequency of Occurrence** |
| Programmer mistakes | $2,000 | 4 times per 3 months |
| Loss of intellectual property | $5,000 | 1 per 73 days *(1 year = 365 days)* |

1. (25 points) Using the information from the previous problem and the following table, calculate the **post-control ARO** and **ALE** for each threat category listed. Calculate the **Cost-Benefit Analysis** (**CBA)** for the planned risk control approach in each threat category. For each threat category, **determine whether the proposed control is worth the costs**.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Threat Category** | **Cost per Incident** | **Frequency of Occurrence** | **Cost of Control** | **Type of Control** |
| Programmer mistakes | $2,000 | 1 time per 6 months | $29,000 | Training |
| Loss of intellectual property | $5,000 | 1 time per 2 years | $20,000 | Firewall/IDS |

**Example 2:**

1. (10 points) What is PCI DSS and why is it important for information security?

### (10 points) Which law was created specifically to deal with encryption policy in the United States?

1. (10 points) Find 2 web-sites dedicated to computer security and provide your brief opinions for those 2 sites.
2. (10 points) Locate two tools you think would be useful to help defend against an attack. Provide your brief explanations on how those two tools can be used.
3. Visit the National Conference of State Legislatures Web site at [www.ncsl.org](http://www.ncsl.org) and find the **Computer Crime Statutes** from the search box.
   1. (10 points) Identify which law addresses the **hacking, unauthorized access, computer trespass, viruses, and malware** for **New York**. Screen-shot or copy-paste your search result.
   2. (10 points) Identify which law addresses **Ransomware and Computer Extortion** for **California**

### (20 points) To have the safer online communication, Electronic Frontier Foundation provides several tips and tool guides. Please select one guide (e.g., How to: XXX) from the list of tool guides in [https://ssd.eff.org/module-categories/tool-guides.](https://ssd.eff.org/module-categories/tool-guides) Provide a summary (150 words or above) for the selected guide and address your thoughts (100 words or above).

1. (20 points) Using a Web browser, go to [www.eff.org](http://www.eff.org/). What are the current top **two concerns** of this organization? Provide a **brief summary** (150 words or above)to indicate what you learned from the reading.