

Program: Bachelor of Science – Computer Information Systems

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Please complete this form for each undergraduate, minor, certificate, and graduate program (e.g., B.A., B.S., M.S.) in your department. Please copy any addenda (e.g., rubrics) and paste them in this document, and submit it to the dean of your college/school as per the deadline established. You'll also find the form at the assessment website at <http://www.colostate-pueblo.edu/Assessment/ResultsAndReports/Pages/default.aspx>.

**Brief statement of Program mission and goals:**

HSB Mission statement:

The mission of the Hasan School of Business at Colorado State University-Pueblo is "We transform students, innovate in teaching, conduct ourselves with professionalism, and engage with and positively impact our stakeholders."

- Transform: We welcome students from a broad spectrum, including many from lower socio-economic strata, under-represented populations, and first generation students. The core of our mission is effecting positive change in our students so that they are prepared as business professionals.
- Innovation: We seek to improve and implement best practices. We also work to encourage innovation at our university and in regional business, government and non-profit organizations.
- Professionalism: We are recognized in the community for our professionalism. We hold ourselves to high performance standards of collegiality and ethical behavior. We seek to inspire the same in our students.
- Engagement: We connect with students, alumni, employers, community members and other stakeholders to work together and to share knowledge. We build student skills through active learning, experiential education, and collaborations with businesses and community members.
- Impact: We make ongoing campus and community contributions through a variety of service activities. Our research has positive effects on organizational knowledge and practice. Graduates of the Hasan School of Business are a critical component of Pueblo's economic infrastructure, while many make contributions in other cities, states, and countries.

## Goals for Computer Information Systems Majors

The CIS graduates will be able to:

- Design and develop desktop and web-based applications using modern programming tools, techniques, and architectures.
- Design and develop internet-based systems using sound web design principles and multi-tiered architectures.
- Model, design, and develop database systems, including administrative processes and procedures for database management.
- Develop and configure safe and secure system infrastructures that incorporate hardware, telecommunications, systems software, operating system, and systems configuration components.
- Perform all facets of a modern systems analysis and design methodology, including systems implementation.
- Plan, schedule and coordinate all tasks and activities involved in IT project management

### I. Program student learning outcomes (SLOs) assessed in this cycle, processes, results, and recommendations.

A. Which of the program SLOs were assessed during this cycle? <b>Please include the outcome(s) verbatim from the assessment plan.</b>	B. When was this SLO last assessed? <b>Please indicate the semester and year.</b>	C. What method was used for assessing the SLO? <b>Please include a copy of any rubrics used in the assessment process.</b>	D. Who was assessed? Please fully describe the student group(s) and the number of students or artifacts involved.	E. What is the expected achievement level and how many or what proportion of students should be at it?	F. What were the results of the assessment ?	G. What were the department's conclusions about student performance?	H. What changes/improvements to the <u>program</u> are planned based on this assessment?
<b>FA.18, CIS240 SLO 4 – Ethic Issues</b> 4.1. Identify ethical issues, 4.2. Identify alternative solutions,	<b>SP.17</b> (CIS432) and <b>FA. 15 &amp; SP.16</b> (CIS 150)	A case study has been used to assess ethic issues. The students were asked to review videos and articles related	<b>26</b> students in <b>CIS240</b> (Systems analysis and design) were assessed based on their answers	We expect that at least <b>80%</b> of the students either meet or exceed expectation (Need	<b>89%, 87%,</b> and <b>92%</b> of the students either meet or exceed expectation for sub	Overall the students' performance exceeds the expectation on SLO 4 (ethic issues) including 4.1.(89%), 4.2.(87%) and 4.3.(92%). The assessment results	We can take a few approaches to improve SLO. 1. <b>Simplify</b> the SOL <b>rubrics</b> and develop more <b>precised language</b> 2. Possibly increase

4.3. Supply appropriate solutions		to an ethic issue in IT (i.e., will robots and AI take human jobs? ) and answer three questions to identify ethic issues, evaluate alternatives, and decide appropriate solution (See Appendix I).	to the three ethic analysis questions.	improvement , meet expectation, and exceed expectation, are the three achievement levels from low to high).	learning goal <b>4.1</b> (identify ethic issues), <b>4.2</b> (identify alternative solutions), and <b>4.3</b> (decide appropriate solution), respectively .	are <b>much higher than the previous assessments</b> in 2015 and 2016 (around 50% meet or exceed expectation in three different classes).  The students' performance (94%) exceeds the expectation on SLO 1.3 (implementation and maintenance).	<b>rigorousness</b> of the rubric (and/or assessment method) 3. Revisit the curriculum map and <b>identify new assessment tools and methods</b> based on the suggestions from the best practice presentation and the previous experience. 4. <b>Test out</b> the new assessment tools and methods
SP.19, CIS 271 (Advanced Java) <b>SLO 1.3</b> – problem solving (Implementation and maintenance)	<b>2012</b> (CIS271 and CIS 311), <b>2014</b> (CIS432)	<b>SP.19</b> , the final practical test has been used to assess sub learning goal 1.3.(Appendix II).	<b>29</b> students in <b>CIS271</b> (advanced Java) were assessed based on their performance in final practical test.	We expect that at least <b>80%</b> of the students either meet or exceed expectation (Need improvement , meet expectation, exceed expectation, the level from low to high).	<b>93.93%</b> of the students in CIS271 either meet or exceed expectation of sub learning goal <b>1.3</b> . (implementation and maintenance)	The assessment result is <b>much higher than the previous assessments</b> in 2014 (78% meet or exceed expectation in three different classes).	

**II. Follow-up (closing the loop) on results and activities from previous assessment cycles. In this section, please describe actions taken during this cycle that were based on, or implemented to address, the results of assessment from previous cycles.**

A. What SLO(s) did you address? Please include the outcome(s) verbatim from the assessment plan.	B. When was this SLO last assessed? Please indicate the semester and year.	C. What were the recommendations for change from the previous assessment?	D. Were the recommendations for change acted upon? If not, why?	E. What were the results of the changes? If the changes were not effective, what are the next steps or the new recommendations?
Learning objective 4: Ethic issues. And learning objective 1.3.: Problem solving(implementation and maintenance)	SLO 3: <b>SP.17</b> (CIS432) and <b>FA. 15 &amp; SP.16</b> (CIS 150)  SLO1.3.: <b>2012</b> (CIS271 and CIS 311), <b>2014</b> (CIS432)	The students did not do well in identifying and solving ethic issues in the previous assessment (around 50% meet and exceed expectation). The recommendation is to address ethic issues in all CIS courses such as case discussion, in-class practice, and guest speaker, etc.  The problem solving was not too bad (78% meet or exceed expectation in 2014) from the previous assessment. It's the time to revisit this SLO after five years(2019).	Yes.  The main theme of 2018-19 (in terms of AOL/SLO) is ethic issues. Every CIS faculty made efforts to address ethic issues in their classes.  For example, in order to address ethic issues CIS150 proposed (and has been approved by CAPB) to <b>change the course name</b> from Computer Information Systems to ETHICS, COMPUTER AND SOCIETY.  In other classes such as CIS240, CIS432, and CIS350, the faculty <b>discussed ethic case</b> and <b>invited guest speakers</b> to address ethic issues.	Overall the students' performance exceeds the expectation on SLO 4 (ethic issues) including 4.1.(89%), 4.2.(87%) and 4.3.(92%). The assessment results are <b>much higher than the previous assessments</b> in 2015 and 2016 (around 50% meet or exceed expectation in three different classes).  The students' performance (94%) exceeds the expectation on SLO 1.3 (implementation and maintenance). The assessment result is <b>much higher than the previous assessments</b> in 2014 (78% meet or exceed expectation in three different classes).

Summary and comments:

In AY 2018-2019, we assessed SLO 4 (including 4.1., 4.2, and 4.3) and SLO 1.3.:

Objective 4: Ethic issues, including three sub-learning goals,

- 3.1. Identify ethic issues
- 3.2. Identify alternate solutions
- 3.3. Provide appropriate solutions

Objective 1: Analyze, design, and implement and maintain an information system

1.3. Implementation and maintenance

CIS 240 (Systems Analysis and Design, a development-stage CIS core class) was assessed in Fall 2018 for SLO 4 and CIS271 (Advanced Java programming, a development-stage CIS core class) was assessed in Spring 2019 for SLO 1.3. The assessment questions, rubrics, and results are attached as the appendix.

The assessment results show:

1. In CIS240, **89%, 87%, and 92%** of the students either meet or exceed expectation of sub-goal 4.1.(identify ethic issues), 4.2.(identify alternate solutions), and 4.3.(provide appropriate solutions), respectively.
2. In CIS271, **94%** of the students either meet or exceed expectation of sub-learning goal 1.3. (problem solving implementation and maintenance).

The results indicate:

1. Overall students meet or exceed the expectations on learning objective 4.1, 4.2., 4.3, and 1.3.

Future assessment plan:

1. Re-visit Problem Solving (SLO 1) in AY20-21.

Future improvement:

1. **Simplify** the SOL **rubrics** and develop more **precised language**
2. Possibly increase **rigorousness** of the rubric (and/or assessment method)

3. Revisit the curriculum map and **identify new assessment tools and methods** based on the suggestions from the best practice presentation and the previous experience.
4. **Test out** the new assessment tools and methods

## Appendix I. CIS240 Fall2018 Assessment Question, Rubrics, and Results

### Assessment question:

Case study: Will robots and AI take our jobs?

Below are some videos and discussions related to the ethical issue: will robots and AI take our jobs, from different perspectives.

<https://www.youtube.com/watch?v=a-7Azih0D98>

<https://www.youtube.com/watch?v=skG3okhx2TU>

<http://www.bbc.com/news/technology-34066941>

<https://www.youtube.com/watch?v=th3nnEpITz0>

Feel free to find any other resources regarding this issue. Discuss the following three questions (be creative and innovative, 25 points) and response to one other student (5 points). This discussion is due by the end of the day on Friday (11:59pm on 11/16).

1. What do you think is the ethical issue here?
2. What are the alternative solutions?
3. What is(are) your suggestion(s) or takeaway(s)?

**Assessment rubrics:** CIS Learning Objectives 4-Identify ethical issues and provide alternatives or solutions

Evaluation Criteria	Exceeds Expectations	Meets Expectations	Needs Improvement	Score
<b>Q.1. Identify ethical issues</b>	Identifies critical and any additional ethical issues	Identifies the critical ethical issues	Identifies no critical ethical issues	
<b>Q.2. Identify alternative solutions</b>	Identifies multiple alternative solutions	Identifies an alternative solution	Identifies no alternative solutions	

<b>Q.3. Supply appropriate solutions</b>	Provides multiple appropriate solutions	Provides an appropriate solution	Provides no appropriate solutions	
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**Assessment results:**

Sub-Goals #	Goals	Meet or Exceed Expectation	Need Improvement
1	Identify ethical issues	89.09%	10.91%
2	Identify alternative solutions	87.27%	12.73%
3	Supply appropriate solutions	92.38%	7.62%

## Appendix II. CIS271 Spring2019 Assessment Question, Rubrics, and Results

### Assessment question:

CIS 271 Final – Practical Test (100 points)

Write a complete Java program for each question and make a zip file which contains all of your source code and bytes code (class file). Upload your zip file to the Practical2 section under Exams in Blackboard. This is an individual and open book/note test but you may not allowed to use code written by others.

1. (50 points)

Write a recursive method called writeNums that takes an integer n as a parameter and prints to the console the first n integers starting with 1 in sequential order, separated by commas, For example, the following calls:

```
writeNums(5);
```

```
System.out.println(); // to complete the line of output
```

```
writeNums(12);
```

```
System.out.println(); // to complete the line of output
```

Should produce this output:

```
1, 2, 3, 4, 5
```

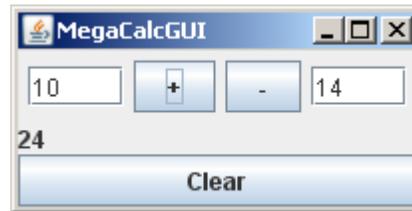
```
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
```

Your method should throw an IllegalArgumentException if passed a value less than 1.

2. (50 points)

Write a program that creates the following window layout. The window title is “MegaCalcGUI”. In the window there are two text fields in which the user types the operands to a binary + (plus) and – (minus). When the + or - button is pressed, the text in the two fields is treated as two integers, which are summed or subtracted, and the resulting integer is displayed on the screen as the text of a

result label. If the Clear button is pressed, the text in the two fields and the result label should be cleared out. Your GUI should look like below.



**Assessment rubrics:**

**CIS Learning Objectives 1: Analyze, design, and implement and maintain an information system**

Evaluation Criteria	Exceeds Expectations	Meets Expectations	Needs Improvement	Score
<b>Implementation and Maintenance</b>	Shows strong ability to implement, test, debug, and deploy an error-free & completely functioning Information System	Shows some ability to implement, test, debug, and deploy implement an error-free & completely functioning Information System	Often fails to implement, test, debug, and deploy an error-free & completely functioning Information System	

**A more detailed rubric to assess 1.4. in this specific case:**

Question 1:

1. There should be no compile errors.
2. There should be no run time errors.
3. There should not be a comma after the last number.
4. There should be a comma between each of the numbers.
5. writeNums() should be a recursive method that keeps calling itself until the number reaches a specified end.

Question 2:

1. There should be no compile errors.
2. There should be no run time errors.
3. Addition and subtraction should work
4. The answer should presented in the window.
5. All buttons should work.

**Assessment results:**

Sub-Goals #	Goals	Meet or Exceed Expectation	Need Improvement
1.3.	Implementation and maintenance	93.93%	6.07%

### **Appendix III. CIS Learning Objectives**

At the conclusion of the CIS program, students will demonstrate the ability to:

Objective 1. Analyze, design, implement, and maintain an information system.

Objective 2. Communicate clearly in writing and speaking.

Objective 3. Work effectively as a team member for a common purpose.

Objective 4. Identify ethical issues and provide alternatives or solutions.

**CIS Learning Objectives 1: Analyze, design, and implement and maintain an information system**

<b>Evaluation Criteria</b>	<b>Exceeds Expectations</b>	<b>Meets Expectations</b>	<b>Needs Improvement</b>	<b>Score</b>
<b>Analysis</b>	Shows strong ability to identify what an Information System should do	Shows some ability to identify what an Information System should do	Often fails to identify what an Information System should do	
<b>Design</b>	Shows strong ability to identify how components of an Information System should be implemented and integrated	Shows some ability to identify how components of an Information System should be implemented	Often fails to identify how components of an Information System should be implemented	
<b>Implementation and Maintenance</b>	Shows strong ability to implement, test, debug, and deploy an error-free & completely functioning Information System	Shows some ability to implement, test, debug, and deploy implement an error-free & completely functioning Information System	Often fails to implement, test, debug, and deploy an error-free & completely functioning Information System	

**CIS Learning Objectives 2: Communicate clearly in writing and speaking.**

**Oral Communication Rubric**

<b>Evaluation Criteria</b>	<b>Exceeds Expectations</b>	<b>Meets Expectations</b>	<b>Needs Improvement</b>	<b>Score</b>
<b>Kinetics (Body Language)</b>	<p>Presenter's body language and voice tone demonstrates high confidence and comfort with the subject matter.</p> <p>Presenter demonstrates high confidence, empathy and comfortable interaction with the audience.</p> <p>Presenter gestures are confident, relaxed and natural and match the content and purpose of the presentation.</p> <p>Presenter makes an excellent delivery with a voice that</p>	<p>Body language and voice tone reflect the presenter's relative comfort and command of the subject matter in interacting with the audience.</p> <p>Presenter uses appropriate gestures and body language that are somewhat confident.</p> <p>Presenter makes a good delivery with some level of confidence in body language and voice modulation.</p>	<p>Body language and voice tone reveal presenter's discomfort and lack of confidence with the subject matter.</p> <p>Presenter reveals a reluctance to interact with the audience.</p> <p>Presenter's body movement is terse and stiff.</p> <p>Presenter may appear fearful or highly nervous of his/her audience.</p> <p>Presenter's body language lacks confidence, and voice projection is often</p>	

	projects enthusiasm, interest and confidence.		hard to understand.	
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<p><b>Organization</b></p>	<p>Presenter follows a very clear and logical sequence in their presentation that the audience can follow.</p> <p>Presenter focuses on the defined and critical points of the presentation and provides clear explanations for each point.</p> <p>Presenter provides clear and concise “takeaways” and conclusions for the audience.</p>	<p>Presenter follows a logical sequence in their presentation but does not provide any additional information.</p> <p>Presenter uses a “checklist” approach to the presentation material.</p> <p>Presentation structure is adequate and mechanical but lacks strong definition and emphasis.</p>	<p>Presenter offers no logical sequence of information.</p> <p>Presenter does not provide clear explanations and elaborations of the subject matter.</p> <p>Presenter fails to focus on the critical points of the presentation.</p> <p>Presenter does not provide clear and concise conclusions for the audience.</p>	
<p><b>Subject Matter Knowledge</b></p>	<p>Presenter clearly demonstrates excellent and in-depth knowledge and confidence with the subject matter.</p> <p>Presenter demonstrates a clear</p>	<p>Presenter reflects a relative comfort with the subject matter.</p> <p>Presenter demonstrates a good understanding of the details and interaction of the elements of the subject</p>	<p>Presenter is unclear and not well informed with the subject matter.</p> <p>The presenter appears to be unsure and disorganized in their presentation of the</p>	

	<p>understanding of the details and interconnection links of the elements of the subject matter.</p> <p>Presenter clearly and thoroughly addresses questions from the audience regarding the subject matter.</p> <p>Presenter makes a professional and thorough analysis and presentation to the audience.</p>	<p>matter.</p> <p>Presenter addresses and replies to most questions regarding the subject matter.</p>	<p>subject material.</p> <p>Presenter may just be repeating facts without understanding details or interaction with other elements of the subject matter.</p> <p>Presenter cannot address basic questions regarding the subject matter.</p>	
<b>Articulation (Delivery)</b>	<p>Presenter speaks clearly and loudly enough and for all in audience to hear, at a comfortable rate, makes no grammatical errors, and pronounces all terms correctly and precisely.</p> <p>Presenter is</p>	<p>Presenter speaks clearly and loudly enough to be heard by most in audience, at an appropriate rate, (some/rare awkward pauses or halting delivery), makes few grammatical errors, and pronounces most terms correctly with fluid</p>	<p>Presenter mumbles, speaks too quietly to be heard by many in audience, mispronounces words, and makes serious and persistent grammatical errors throughout the presentation.</p> <p>Presenter loses train of thought and is</p>	

	<p>enthusiastic and engaging.</p> <p>Presenter is extemporaneous and natural.</p>	<p>delivery overall.</p>	<p>tentative.</p>	
<p><b>Content Clarity and Completeness</b></p>	<p>Presenter handles all elements professionally.</p> <p>Presenter develops and supports ideas using well- chosen examples and creative details.</p>	<p>Presenter handles material competently and includes essential information, which is factually correct.</p>	<p>Presenter misses two or more essential elements.</p> <p>Presentation contains major factual errors and mis- representations.</p>	

## Written Communication Rubric

Evaluation Criteria	Exceeds Expectations	Meets Expectations	Needs Improvement	Score
<b>Subject Matter Knowledge</b>	Clearly demonstrates excellent and in-depth knowledge of the subject matter.  Demonstrates an excellent understanding of the details and interconnection links of the elements of the subject matter.	Demonstrates fair knowledge of the subject matter.  Demonstrates a fair understanding of the details and interconnection links of the elements of the subject matter.	Demonstrates poor/inadequate knowledge of the subject matter.  Demonstrates a poor understanding of the details and fails to show interconnection links of the elements of the subject matter.	
<b>Literacy (grammar, spelling, punctuation)</b>	No grammar, spelling, punctuation errors and excellent word usage.  Writing at expected grade level or above.	Have some grammatical errors, spelling and punctuation errors.  Writing at one or two levels below current grade level.	Have many grammatical errors, spelling and punctuation errors.  Writing at more than two levels below current grade level.	
<b>Logical Flow</b>	Demonstrates ability to produce professional quality documents (fully footnoted and referenced, with proper cover pages, headings, footings, and table of contents)	Produces documents with minimal professional elements (footnotes, references, cover pages, headings, footings, table of contents)	Produced documents are lacking significant professional elements (footnotes, references, cover pages, headings, footings, table of contents)	
<b>Proper References</b>	Expertly integrates relevant articles, uses correct citations, and references based on certain academic writing styles.	Fairly integrates relevant articles, has some correct citations and references.	Fails to integrate relevant articles, citations, or references.	

**CIS Learning Objectives 3: Work effectively as a team member for a common purpose**

<b>Evaluation Criteria</b>	<b>Exceeds Expectations</b>	<b>Meets Expectations</b>	<b>Needs Improvement</b>	<b>Score</b>
<b>Attending team meetings</b>	Attends all team meetings without being late	Attends most team meetings. If likely to be absent or late, informs others ahead of time	Rarely attends team meetings  Attendance record is haphazard and inconsistent; may be absent or late without notice	
<b>Participating meeting discussions</b>	Actively participates in discussion and asks questions	Participates in discussions, letting others provide the direction	Observes passively and says little or nothing	
<b>Participating non-meeting discussions, i.e. emails, online chatting, or phone calls</b>	Actively participates in or initiates discussions and project related communication	Participates in discussions, letting others provide the direction	Rarely responds to team project related discussions	
<b>Leadership</b>	Takes a large part in setting group goals and agendas	Takes some part in setting group goals and agendas	Let others set and pursue the agenda	

<b>Understanding of project concepts</b>	Listens actively and shows understanding by paraphrasing or by acknowledging and building on others' ideas	Occasionally introduces the information or asks questions	Has limited understanding of the project concepts	
<b>Contributing to the final deliverables. i.e. report, PowerPoint, etc.</b>	Carries own share of the group's responsibilities, and organizes or helps organize final deliverables	Carries own share of the group's responsibilities	Does not fulfill own share	

**CIS Learning Objectives 4: Identify ethical issues and provide alternatives or solutions**

<b>Evaluation Criteria</b>	<b>Exceeds Expectations</b>	<b>Meets Expectations</b>	<b>Needs Improvement</b>	<b>Score</b>
<b>Identify ethical issues</b>	Identifies critical and any additional ethical issues	Identifies the critical ethical issues	Identifies no critical ethical issues	
<b>Identify alternative solutions</b>	Identifies multiple alternative solutions	Identifies an alternative solution	Identifies no alternative solutions	
<b>Supply appropriate solutions</b>	Provides multiple appropriate solutions	Provides an appropriate solution	Provides no appropriate solutions	

## Appendix IV. CIS Curriculum Map

	1 - Analyze, Design <sup>1</sup>	2 - Written/Oral Communication	3 - Team Skills	4 - Ethics
CIS 150 Computer Information Systems		x (I) <sup>2</sup> Research Paper	x(I) Team Project	x (I) Case Study
CIS 171 Intro to Java Programming	c,d (I) homework			
CIS 185 PC Architecture	a,d (I) in-class lab exercise	x (I) Oral Presentation		
CIS 240 Systems Analysis and Design	a,b (I) Homework, Exam			
CIS 271 Adv. Program Design with Java	b,c,d (D) Project		x (D) Team Project	
CIS 289 Network Concepts	a,b (D) Case Projects	x (D) Paper, Presentation		x (D) Exam
CIS 311 Introduction to Web Development	a,b,c,d (D) Individual Project, Group Project		x (D) Group Project	
CIS 315 UNIX Operating System	c,d (D) Homework, Exam, quiz			x (D) No artifact
CIS 350 Database Management	a,b,c (D) Quiz, Homework, Exam, Project	x (D) Project Report, Presentation	x (D) Term project	x (D) Case study

<sup>1</sup> a-analysis, b-design, c-implement, and d-maintenance.

<sup>2</sup> I-Introductory, D-development, and M-mastery.

CIS 432 Senior Project	a,b,c,d (M) Team Semester Project	x - written (M) Oral(M) Team Project Document & Presentation	x (M) Semester Project	x (M) Case Study
CIS 493 Senior Seminar		x (M) Case Study		x (M) Case Study