Date Submitted: 08/29/19 5:20 pm

Viewing: 10KL5623BS : Computer Science + ~~&~~ Crop Sciences, BS

Last approved: 04/10/19 10:20 am

Last edit: 09/12/19 11:43 am

Changes proposed by: Scott Bartlett

Catalog Pages Using this Program	Computer Science & Crop Sciences, BS

In Workflow

1. **U Program Review**
2. **1802 Head**
3. **KL Committee Chair**
4. **KL Dean**
5. **University Librarian**
6. **Provost**
7. **Senate EPC**
8. Senate
9. U Senate Conf
10. Board of Trustees
11. IBHE
12. DMI

Approval Path

1. 08/30/19 9:46 am Deb Forgacs (dforgacs): Approved for U Program Review
2. 08/30/19 9:51 am Adam Davis (asdavis1): Approved for 1802 Head
3. 08/30/19 10:34 am Anthony Yannarell (acyann): Approved for KL Committee Chair
4. 08/30/19 11:32 am Anna Ball (aball): Approved for KL Dean
5. 08/30/19 11:44 am John Wilkin

(jpwilkin): Approved for University Librarian
6. 08/30/19 1:21 pm Kathy Martensen (kmartens): Approved for Provost

History

1. Mar 22, 2019 by Deb Forgacs (dforgacs)
2. Apr 10, 2019 by Deb Forgacs (dforgacs)

Proposal Type

Proposal Type:
~~Major (ex.Special Education)~~

This proposal is for a:
Revision

Proposal Title
Revise the Computer Science + Crop Sciences Major for the Bachelor of Science Degree, in the Department of Crop Sciences, College of ACES, and the Department of Computer Science, College of Engineering ~~migration~~

Official Program Name	Computer Science **+** ~~&~~ Crop Sciences, BS
Banner/Codebook Name	BS: Comp Sci & Crop Sci - UIUC
Program Code:	10KL5623BS
Effective Catalog Term	Fall 2020
Sponsor College	Agr, Consumer, & Env Sciences
Sponsor Department	Crop Sciences

Sponsor Name	**Dr. A. Lane Rayburn & Dr. Christopher Harbourt**	Sponsor Email	**arayburn@illinois.edu & harbourt@illinois.edu**
College Contact	**Brianna Gregg**	College Contact Email	**bjgray2@illinois.edu**

Is this program interdisciplinary?

No ~~Yes~~

Academic Level	Undergraduate
CIP Code	110199 - Computer and Information Sciences, Other.

Program Description and Justification

Justification for proposal change:

The Department of Crop Sciences, with support from the Department of Computer Science, proposes revisions to the curriculum of the Computer Science + Crop Sciences Major. All proposed changes occur under Crop Sciences. The changes include: (1) reducing the number of required courses in Crop Sciences from 34-36 hours to 27-29 hours; (2) allowing greater flexibility in the Crop Sciences courses used to satisfy the major requirements; (3) an update of the courses listed to reflect revised course offerings in the Department of Crop Sciences, including two courses in agricultural data analytics that have been developed with this major in mind; and (4) the creation of new categories under the Crop Sciences requirements to better describe the course options (Crop Sciences Core, Foundational Data Analytics [with an emphasis in agricultural data analytics], and Crop Sciences Electives), this being a part of the curriculum update and recommendations department wide.
Crop Sciences classes, instead of including only specific required Crop Sciences courses as before, now allow some flexibility in the choices of courses in the crop science discipline. A core set of courses will be required by all Bachelor of Science Degree students in the Department of Crop Sciences. "Foundational Data Analytics" courses will build upon the quantitative and computational training students receive in other courses and provide additional data analytics training specific to problems in the agricultural, environmental, and life sciences. "Crop Sciences Electives" will enable students to specialize in an area of their choosing, whether that be genetics, agronomy, pest management, etc., as opposed to only having the option of plant genetics, as in the previous major.

The revisions to this major will allow students greater flexibility in scheduling

The revisions to this major will allow students greater flexibility in scheduling coursework and will reduce the proposed number of Crop Sciences credit hours to a value that is more consistent with other CS + X degrees on campus. The previous version of this major was highly specific, with more courses required in the the Crop Sciences portion of the degree than any of the other "X" programs within the other CS + X degree programs. The median credit hour requirement for departmental coursework for other CS + X majors is 24 hours, as opposed to 34-36 hours in the former Crop Sciences Core. Due to this discrepancy in credit hour requirements, students were having difficulty scheduling courses in a way that would make it feasible for them to graduate within four years, and students were having difficulty transferring into the Major. Furthermore, the former requirements provided students with little flexibility in the courses they took, whereas the new proposed courses would enable students to to take specialized and advanced courses in genetics, agronomy, plant management, or another aspect of crop science. Through implementation of the proposed revisions, students will also have more flexibility to gain experiences through internal research programs and external internships. The revised format will enable students to gain experiences through internships and campus research experiences. Lastly, the revised version of this major contains an updated list of courses that reflects recent course revisions, course deactivations, and course developments.
~~migration~~

Is This a Teacher Certification Program?

No

Will specialized accreditation be sought for this program?

No

Admission Requirements

Desired
Admissions Term

Provide a brief narrative description of the admission requirements for this program. Where relevant, include information about licensure requirements, student background checks, GRE and TOEFL scores, and admission requirements for transfer students.

Describe how critical academic functions such as admissions and student advising are managed.

Enrollment

Describe how this revision will impact enrollment and degrees awarded.

There will be no impact. ~~migration~~

Estimated Annual Number of Degrees Awarded

Year One Estimate	5th Year Estimate (or when fully implemented)

Delivery Method

What is the program's primary delivery method?
Face-to-Face

Other than certification via the students' degree audits, is there any additional planned mechanism to award/honor successful completion of the minor?
No

Budget

Are there budgetary implications for this revision? No

Will the program or revision require staffing (faculty, advisors, etc.) beyond what is currently available?
No

Additional Budget Information

Attach File(s)

Resource Implications

Facilities

Will the program require new or additional facilities or significant improvements to already existing facilities?
No

Technology

Will the program need additional technology beyond what is currently available for the unit?

No

Non-Technical Resources

Will the program require additional supplies, services or equipment (non-technical)?

No

Resources

Faculty Resources

Please address the impact on faculty resources including any changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc. Describe how the unit will support student advising, including job placement and/or admission to advanced studies.

Enrollment in Crop Sciences courses is expected to be similar if not slightly increased. Although the proposed credit requirement is decreasing by 7 credit hours, the former Major has been facing difficulty in meeting the formerly proposed student enrollment of 20 students per year. This difficulty is largely due to the number of credit hours required in Crop Sciences coursework deterring students from pursuing a degree in the Major and making it almost impossible for transfer students to complete the degree in two years from the semester of transfer. This may increase our student-faculty ratios slightly due to expected increased enrollment and may slightly increase the class size of the newly required courses slightly by 5-10 students. This should not affect the number of faculty or the class size of these courses. There may be a slight decrease of 2-4 students in some of the formerly required genetics coursework in Crop Sciences due to increased flexibility in the Major's requirements, but these units will stay within Crop Sciences through the Crop Sciences Electives requirement. ~~migration~~

Library Resources

Describe your proposal's impact on the University Library's resources, collections, and services. If necessary please consult with the appropriate disciplinary specialist within the University Library.

We expect the impact on the University Library to remain at the same level. ~~migration~~

Instructional Resources

Will there be any reduction in other course offerings, programs or concentrations by your department as a result of this new program/proposed change?

No

Does this new program/proposed change result in the replacement of another program?

No

Does the program include any required or recommended subjects that are offered by other departments?

Yes ~~No~~

Required courses

Explain how these additional courses will be used by the program

We have only changed the Crop Sciences requirements. However, we are rephrasing the Computer Science Technical Track and correcting the credit hours. We have contacted those departments, letters are attached.

Attach letters of support from other departments.

CS+CPSC_support_letter_MATH.pdf
CS-CPSC-revision_CS.pdf

Financial Resources

How does the unit intend to financially support this proposal?

Will the unit need to seek campus or other external resources?

No

Attach letters of support

Will an existing tuition rate be used or continue to be used for this program?

Yes

Program Regulation

Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable.

Is the career/profession for graduates of this program regulated by the State of Illinois?

No

Program of Study

All proposals must attach the new or revised version of the Academic Catalog program of study entry. Contact your college office if you have questions.

Revised programs **CS+CPSC Side by Side.xlsx**

Attach a side-by-side comparison with the existing program AND, if the revision references or adds "chose-from" lists of courses students can select from to fulfill requirements, a listing of these courses, including the course rubric, number, title, and number of credit hours.

Catalog Page Text

Catalog Page Text: Description of program for the catalog page. This is not official content, it is used to help build the catalog pages for the program. Can be edited in the catalog by the college or department.

Statement for Programs of Study Catalog

Course List

Code	Title	Hours
Composition I and Speech		
RHET 105 & CMN 101	Writing and Research and Public Speaking	6-7
Advanced Composition		
Select from campus-approved list.		3-4
Cultural Studies		
Select one course from Western culture, one from non-Western culture, and one from U.S. minority culture from campus approved lists.		9
Foreign Language		
Coursework at or above the third level is required for graduation.		0-15
Quantitative Reasoning I		
See Mathematical Foundations for specific requirement.		3
Quantitative Reasoning II		
See Mathematical Foundations for specific requirement.		3
Natural Sciences and Technology		
See Crop Sciences Core for specific requirement.		6
Humanities and the Arts		
Select from campus-approved list.		6
Social and Behavioral Sciences		
Select from campus-approved list.		6
ACES Required		
ACES 101	Contemporary Issues in ACES	2
Computer Science Core		22
CS 100	Freshman Orientation (recommended)	1

Code	Title	Hours
CS 125	Intro to Computer Science	4
CS 126	Software Design Studio	3
CS 173	Discrete Structures	3
CS 225	Data Structures	4
CS 374	Introduction to Algorithms & Models of Computation	4
CS 421	Programming Languages & Compilers	3
Computer Science Technical Track		8-11
Choose from the following options:		
CS 233	**Computer Architecture**	
& CS 241	**and System Programming**	
OR		
CS 240	**Introduction to Computer Systems**	
& Two CS 4XX	**Any two (2) 400-level CS courses except CS 491**	
Mathematical Foundations (fulfills Quantitative Reasoning I and II)		12-13
CS 361	Probability & Statistics for Computer Science	3
MATH 220	Calculus	4-5
or MATH 221	Calculus I	
MATH 225	Introductory Matrix Theory	2
MATH 231	Calculus II	3
Crop Sciences Core		15
CPSC 102	**Research in Crop Sciences**	**1**
CPSC 112	Introduction to Crop Sciences	4
CPSC 393	**Crop Sciences Internship**	**3**
or CPSC 395	**Undergrad Research or Thesis**	
CPSC 498	Crop Sci Professional Develpmt	1
Select two of the following:		6
CPSC 226	Introduction to Weed Science	
CPSC 270	Applied Entomology	
PLPA 204	Introductory Plant Pathology	
~~CPSC 261~~	~~Biotechnology in Agriculture~~	~~3~~
~~CPSC 265~~	~~Genetic Engineering Lab~~	~~3~~
~~CPSC 266~~	~~Data in Biology and Agriculture~~	~~4~~
~~CPSC 352~~	~~Plant Genetics~~	~~4~~
Foundational Data Analytics		**6-8**
CPSC 440	Applied Statistical Methods I	4
~~Select two of the following:~~		~~5-7~~
~~CPSC 418~~	~~Crop Growth and Management~~	
~~CPSC 452~~	~~Advanced Plant Genetics~~	
~~CPSC 453~~	~~Principles of Plant Breeding~~	
~~CPSC 466~~	~~Genomics for Plant Improvement~~	
And select one of the following:		
CPSC 441	**Introduction to R Programming**	
CPSC 444	**Introduction to Spatial Analytics**	
Crop Sciences Electives		**6**
CPSC/HORT/PLPA 4XX	**At least one (1) 400-level CPSC/HORT/PLPA course**	

Code	Title	Hours
CPSC/HORT/PLPA XXX	**Any CPSC/HORT/PLPA course except CPSC 241**	
Total Hours		126

DMI Documentation

Attach Final Approval Notices

Attached Document

Justification for this request

Program Reviewer Comments

Key: 79

Current Requirement	Current Hours
Composition I and Speech	**6-7**
RHET 105: Writing and Research	4
CMN 101: Public Speaking	3
Advanced Composition	**3-4**
Select from campus-approved list.	
Cultural Studies	**9**
Select one course from Western culture, one from non-Western	
culture, and one from U.S. minority culture from campus approved	
lists.	
Foreign Language	**0-15**
Coursework at or above the third level is required for graduation.	
Quantitative Reasoning I	**3**
See Mathematical Foundations for specific requirement.	
Quantitative Reasoning II	**3**
See Mathematical Foundations for specific requirement.	
Natural Sciences and Technology	**6**
See Crop Sciences Core for specific requirement.	
Humanities and the Arts	**6**
Select from campus-approved list.	
Social and Behavioral Sciences	**6**
Select from campus-approved list.	
ACES Required	**2**
ACES 101: Contemporary Issues in ACES	2
Computer Science Core	**22**
CS 100: Freshman Orientation	1
CS 125: Intro to Computer Science	4
CS 126: Software Design Studio	4
CS 173: Discrete Structures	3
CS 225: Data Structures	4
CS 374: Introduction to Algorithms and Models of Computation	4
CS 421: Programming Languages and Compilers	3
Computer Science Technical Track	**9 to 11**

Either CS 240: Introduction to Computer Systems	3
OR CS 233: Computer Architecture	4
AND CS 241: Systems Programming	4
Approved 400-level CS Classes	3 to 7
Mathematical Foundations	**12 to 13**
CS 361: Probability and Statistics for Computer Science	3
MATH 220: Calculus	5
OR MATH 221: Calculus I	4
MATH 225: Introductory Matrix Theory	2
MATH 231: Calculus II	3
Crop Sciences Core	**34 to 36**
CPSC 112: Introduction to Crop Sciences	4
CPSC 261: Biotechnology in Agriculture	**3**
CPSC 265: Genetic Engineering Lab	**3**
CPSC 266: Data in Biology and Agriculture	**4**
CPSC 352: Plant Genetics	**4**
CPSC 498: Crop Sci Professional Development	1
Select two of the following:	**6**
CPSC 226: Introduction to Weed Science	3
CPSC 270: Applied Entomology	3
PLPA 204: Introductory Plant Pathology	3
CPSC 440: Applied Statistical Methods I	4
Select two of the following:	***5 to 7***
CPSC 418: Crop Growth and Development	**3**
CPSC 452: Advanced Plant Genetics	**3**
CPSC 453: Principles of Plant Breeding	**4**
CPSC 466: Genomics for Plant Improvement	**2**

YELLOW HIGHLIGHT = CS 100 was supposed to be recommended, not required. The Computer Science Technical Track was stated incorrectly in the original version. The phrasing and credit hours were revised to how it should have been stated.

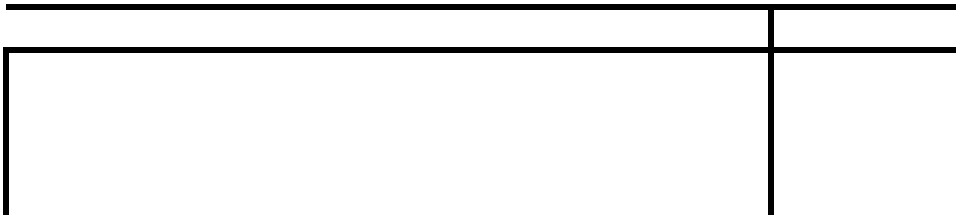
GREEN = Course addition or organizational heading addition.

ORANGE = Course has been removed from the requirements but could still be used to satisf

RED = Course has been removed due to its no longer being offered to on-campus students.

Revised Requirements	Revised Hours
Composition I and Speech	**6-7**
RHET 105: Writing and Research	4
CMN 101: Public Speaking	3
Advanced Composition	**3-4**
Select from campus-approved list.	
Cultural Studies	**9**
Select one course from Western culture, one from non-Western	
culture, and one from U.S. minority culture from campus approved	
lists.	
Foreign Language	**0-15**
Coursework at or above the third level is required for graduation.	
Quantitative Reasoning I	**3**
See Mathematical Foundations for specific requirement.	
Quantitative Reasoning II	**3**
See Mathematical Foundations for specific requirement.	
Natural Sciences and Technology	**6**
See Crop Sciences Core for specific requirement.	
Humanities and the Arts	**6**
Select from campus-approved list.	
Social and Behavioral Sciences	**6**
Select from campus-approved list.	
ACES Required	**2**
ACES 101: Contemporary Issues in ACES	2
Computer Science Core	**22**
CS 100: Freshman Orientation (recommended)	1
CS 125: Intro to Computer Science	4
CS 126: Software Design Studio	4
CS 173: Discrete Structures	3
CS 225: Data Structures	4
CS 374: Introduction to Algorithms and Models of Computation	4
CS 421: Programming Languages and Compilers	3
Computer Science Technical Track	**8 to 11**

CS 233: Computer Architecture	4
AND CS 241: Systems Programming	4
OR CS 240: Introduction to Computer Systems	3
AND Any two (2) 400-level CS courses except CS 491	6 to 8
Mathematical Foundations	**12 to 13**
CS 361: Probability and Statistics for Computer Science	3
MATH 220: Calculus	5
OR MATH 221: Calculus I	4
MATH 225: Introductory Matrix Theory	2
MATH 231: Calculus II	3
Crop Sciences Core	**15**
ADD CPSC 102: Research in Crop Sciences	**1**
CPSC 112: Introduction to Crop Sciences	4
ADD CPSC 393: Off-CampusCrop Sci Internship	**3**
ADD or CPSC 395: Undergrad Research or Thesis	
CPSC 498: Crop Sci Professional Development	1
Select two of the following:	**6**
CPSC 226: Introduction to Weed Science	3
CPSC 270: Applied Entomology	3
PLPA 204: Introductory Plant Pathology	3
ADD Foundational Data Analytics	**6 to 8**
CPSC 440: Applied Statistical Methods I	4
ADD Select one of the following:	
ADD CPSC 441: Introduction to R Programming	**2**
ADD CPSC 444: Spatial Statistics	**4**
ADD Crop Science Electives*	**6**
CPSC/HORT/PLPA 4XX - At least one (1) 400-level	
CPSC/HORT/PLPA course	
CPSC/HORT/PLPA XXX - Any CPSC/HORT/PLPA course	
except CPSC 241	



y Crop Sciences Electives credit.

ILLINOIS

THE GRAINGER COLLEGE OF ENGINEERING

Department of Computer Science
2232 Siebel Center, MC-258
201 N. Goodwin Ave.
Urbana, IL 61801

August 8, 2019

Dr. Adam Davis
Head, Dept. of Crop Sciences
University of Illinois

Dear Dr. Davis

I have reviewed the changes proposed to the CS+CPSC degree program and I find them to be well reasoned and an improvement to the program. The changes give the students more flexibility while also offering greater synergy with the Computer Science part of the degree. The original Crop Science part of the degree at 34-36 credit hours was significantly heavier than the norm for the CS+X degree programs. Its reduction to 27-29 credit hours, while still leaving it on the high side, brings it much closer to the norm. At the same time, the changes direct the students toward courses that emphasize the utility of Computer Science in Crop Science. Additionally, we applaud the efforts of Crop Sciences to introduce new courses especially targeted at enhancing the synergy between the two halves of the program.

There are no programmatic changes to the Computer Science Technical Track of the degree program. As such, there are no adverse impacts made by this revision on the Computer Science program.

In all, the Department of Computer Science support this revision.

Sincerely,

Elsa L. Gunter
Research Professor
Director of Undergraduate Programs
Department of Computer Science
University of Illinois, Urbana - Champaign

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Department of Mathematics

273 Altgeld Hall, MC-382
1409 West Green Street
Urbana, IL 61801

August 20, 2019

Dear Dr. Davis,

The proposed changes to the CS+CPSC degree program will have no noticeable impact upon the enrollments of Mathematics. As the proposed changes are likely to make the program for Crop Sciences more successful, the Department of Mathematics supports these changes.

Sincerely

Randy McCarthy

Randy McCarthy
Professor of Mathematics
Dir. of Undergraduate Studies in Math
rmccrthy@illinois.edu

telephone 217-333-3350 • *fax* 217-333-9576
email office@math.uiuc.edu • *url* http://www.math.uiuc.edu/

Additional information from sponsor to EP

From: Michael, Steven C
To: Lehman, Barbara J
Subject: FW: your senate proposal, our 20.11
Date: Monday, October 14, 2019 3:14:33 PM

Hi Barb,

Please file with 20.11, which answers the questions raised by the committee.

Thanks,
Steve

From: Rayburn, A Lane <arayburn@illinois.edu>
Sent: Tuesday, October 8, 2019 1:35 PM
To: Michael, Steven C <smichael@illinois.edu>; Harbourt, Christopher Mark <harbourt@illinois.edu>
Subject: Re: your senate proposal, our 20.11

Hi Steve

Thank you very much for assisting with this proposal. I will respond to each question in blue underneath the question. Could you look these answers over and let us know if they address the committee's concerns and questions?

We appreciate the Senate Educational Policy Committee's input as we would like to have a strong proposal as we go through the process.

Thanks

Lane

Dr. A. Lane Rayburn
Professor of Cytogenetics
Director of Undergraduate and Online Certificate Programs
Department of Crop Sciences
University of Illinois
AE-120 Turner Hall, 1102 S. Goodwin Ave
Urbana, IL 61801
Telephone - 217 333-4374.
http:// https://cropsciences.illinois.edu/people/profile/arayburn

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From: "Michael, Steven C" <smichael@illinois.edu>
Date: Sunday, October 6, 2019 at 7:58 PM

To: "Rayburn_A.L." <arayburn@illinois.edu>, "Harbourt, Christopher Mark" <harbourt@illinois.edu>
Cc: "Michael, Steven C" <smichael@illinois.edu>
Subject: your senate proposal, our 20.11

Dear Professors,

The Senate Educational Policy Committee has reviewed your proposal regarding CS+Crop Sciences, coded EP.20.11, and wants to give you an opportunity to provide answers or clarifications to questions or concerns listed below.

How you choose to revise your proposal is up to you. The committee is merely giving you a heads-up to questions that it believes, if unanswered within the body of the proposal, might delay expeditious action by the full Senate and subsequent bodies in the approval process.

There were two questions overall.

First, could you tell the committee a little more about CPSC 393, the internship / project course? Who will staff it, where are projects / internships sourced, and the like?

Internships are opportunities for students to gain real-world experience. Most internships are paid positions advertised and coordinated by individual companies, consultants, or on-campus organizations. The students are required to submit a request prior to internship to the department. The Internship opportunity is evaluated and approved by the Director of Undergraduate Studies. Various companies in the region as well as at the Research Park have been involved in our internship programs.

Students typically do internships during the Summer. Before internship credit is given, students are required to write a 5 page paper summarizing the internship experience. In addition, the internship entity is required to provide a summary evaluation of the student. The Director of Undergraduate studies evaluates both of these before credit is given.

Second, resources are always scarce in this university, thus proposals requiring additional resources receive a little extra scrutiny. Your text suggests that you do not need more faculty but you hope to attract more students, notably transfer students. To insure that future readers appreciate that this is a “no new resources” proposal, you might emphasize that a little bit more. Perhaps you could point out that, at present, the major is under forecasted student capacity (which is my sense from reading the proposal). Of course, how you do this is up to you.

The CS + CPSC was originally designed to accommodate 20 students per semester with a total number of 100 students in the major. Due to the constraining nature of the original major, the total number of students accepted in the program in the past two years has been 10. Thus, the number

of students indicated in this revised major is within the capacity of the Department of Crop Sciences.

If you have any questions, please feel free to contact me. The committee's goal is to help you make the clearest case possible for your proposal and facilitating the process of addressing any concerns that might interfere with expeditious approval.

Sincerely,
Steve

Steven C. Michael, Ph.D.
Professor of Entrepreneurship and Strategy
Co-Director, Hoeft Technology and Management Program
Gies College of Business + Granger College of Engineering
Faculty Advisor, Tau Beta Pi, National Engineering Honor Fraternity
University of Illinois at Urbana-Champaign