0329: STATISTICS MINOR, UG

In Workflow

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Approval Path

1. Mon, 19 Apr 2021 15:59:50 GMT
   Deb Forgacs (dforgacs): Approved for U Program Review
2. Thu, 22 Apr 2021 15:52:51 GMT
   Bo Li (libo): Approved for 1583 Head
3. Thu, 22 Apr 2021 17:12:05 GMT
   Kelly Ritter (ritterk): Approved for KV Dean
4. Thu, 22 Apr 2021 17:19:02 GMT
   John Wilkin (jpwilkin): Approved for University Librarian
5. Thu, 22 Apr 2021 17:33:52 GMT
   Kathy Martensen (kmartens): Approved for Provost

History

1. Sep 3, 2019 by Deb Forgacs (dforgacs)

Date Submitted:Fri, 16 Apr 2021 14:17:10 GMT

Viewing:0329 : Statistics Minor, UG

Changes proposed by: Amy Elli

Proposal Type

Proposal Type:

Minor (ex. European Union Studies)

This proposal is for a:

Revision

Proposal Title:

If this proposal is one piece of a multi-element change please include the other impacted programs here.*example: A BS revision with multiple concentration revisions*

Revise the Undergraduate Statistics Minor in the Department of Statistics within the College of Liberal Arts & Sciences

EP Control Number

EP.21.133

Official Program Name

Statistics Minor, UG

Effective Catalog Term

Fall 2021

Sponsor College

Liberal Arts & Sciences

Sponsor Department

Statistics

Sponsor Name

David Unger, Director of Undergraduate Programs in Statistics

Sponsor Email

dunger@illinois.edu

College Contact

Kelly Ritter

College Contact Email

ritterk@illinois.edu

Program Description and Justification

Justification for proposal change:

The proposed revision to the Minor eliminates the two tracks in the current Minor, elements of each, in order to both consolidate and streamline overall course options. The proposed Statistics Minor requires a total of 17-20 credit hours, comparable to the 18-21 required hours in the current Applied Statistics track and the 19-20 required hours in the current Mathematical Statistics track. Similar to the current Statistics Minor, the revised requirements allow a student to complete the Minor by completing six courses. Students must complete a minimum of 17 hours, 9-12 hours (3 courses) of which must be in STAT courses.
The Minor revision is further organized by five required areas of competency, which both reflect the converging content of the two existing tracks and make explicit the clusters of requirements present within those: Statistical Concepts, Data Analysis, Linear Algebra, Mathematical Statistics, and Advanced Statistical Methods.
• Statistical Concepts: This area will retain the same courses allowed by the current Minor. The revision will also include the newly created STAT 107.
• Data Analysis: This area will retain the same courses allowed by the current Minor as well as add ECON 203 and the newly created STAT 207.
• Linear Algebra: This area will retain MATH 225 and 415, remove MATH 125, and add MATH 257 (new course), ASRM 406, and MATH 416.
• Mathematical Statistics: This area will retain STAT 400, remove ECE 313, and add ASRM 401 and MATH 461.

• Advanced Statistical Methods: STAT 420 (Applied Statistics track) and STAT 410 (Mathematical Statistics track) will move from being required to being added to the list of STAT 300- and 400-level allowed as electives.

The revision to the Minor responds to changes in the field of Statistics, to student enrollment patterns, and to necessary incoming skill sets in this area of study. The current Minor has very rigid requirements within each of its two tracks. The proposed revised Minor will eliminate the need to specify tracks, consolidating the two into one cohesive Minor, while at the same time increasing the flexibility of the requirements by allowing more choices within a category, and utilizing new courses that have been recently developed in Statistics and Mathematics. At present, students seeking the Minor are making regular modifications/substitutions to the requirements within each track. The changes in the proposed Minor revision address these typical substitutions.

These changes also add a core that accounts for different student skill sets upon entry to the Minor, allowing for flexible ways to meet the necessary competencies needed for success in the Minor via several different course options. For example, a student with AP or other equivalent credit for STAT 100 will meet the requirement for Statistic Concepts, but will still need to take core courses in the other four areas. Students who want to fulfill core requirements in the five areas with courses outside the Statistics department may also do so in this revision so long as they still complete 9-12 hours in STAT classes within the Minor.

• Statistical Concepts: This area will continue to allow a student's first course to come from a variety of departments on campus: ACE 261, CPSC 241, ECON 202, EPSY 280, PSYC 235, STAT 100, and SOC 280. The newly created STAT 107: Data Science Discovery will provide yet another introductory option that hones in on greater computational skill as well.

• Data Analysis: STAT 200 and 212 will remain in this area. Just as STAT 212: Biostatistics provides an intermediate course for those wanting an interdisciplinary option, ECON 203: Economic Statistics II will be include to serve one of our largest populations in the Minor – Economics majors. Further, our newly created STAT 207: Data Science Exploration is a natural follow-up to STAT 107.

• Linear Algebra: The removal of MATH 125 and addition of MATH 257: Computational Linear Algebra serves to address the changing needs of those in applied statistics by offering more rigorous and computational treatments of linear algebra. ASRM 406 (formerly MATH 410) and MATH 416 are two courses commonly used as substitutions by students in Actuarial Science and Mathematics. Their inclusion will remove the substitution process and be a more inviting sign to students in those majors.

• Mathematical Statistics: As many Statistics minors are Actuarial Science or Mathematics majors, adding ASRM 401 (a.k.a. STAT 408; controlled by Statistics) and MATH 461 will create an easier pathway for those students. Further, those two courses along with STAT 400 comprise the declaration criteria for entry into the Statistics Major. Adding them will bring greater synergy between the Major and Minor programs. ECE 313 is being removed because it does not match the same complete focus on mathematical statistics as the others in this area.

• Advanced Statistical Methods: This fifth area requires two advanced 300- or 400-level courses to be completed. With our field and methods ever evolving to meet data needs, allowable electives range in topics including mathematical statistics (e.g., STAT 410, 433), applied statistics (STAT 429, 448), data science (STAT 432, 447), computational statistics (STAT 428, 440), and an all-encompassing focus (STAT 420, 425).

Is this program interdisciplinary?

No

Is this minor?

A Comprehensive study in a single discipline

Academic Level

Undergraduate

Is This a Teacher Certification Program?

No

Will specialized accreditation be sought for this program?

No

Enrollment

Will the department limit enrollment to the minor?

No

Describe how the department will monitor the admission to/enrollment in the minor.

Over the past two years, there are an average of 250 students in the minor each semester, and we predict that it will increase to over 300 students over the next three years. This is a prediction based on current trends in our field and not due to any changes being proposed in this Minor revision. However, we believe these changes will positively affect students seeking to complete the Minor and therefore not adversely affect projected enrollment.

Are there any prerequisites for the proposed minor?

No

Describe how this revision will impact enrollment and degrees awarded.

Admission to the Statistics Minor is controlled by the College of Liberal Arts & Sciences. With our department, we will continue to monitor the enrollment status each semester in an attempt to supply our students with enough seats in courses to fulfill the minor requirements.

What is the typical time to completion of this program?

3 years

What are the minimum Total Credit Hours required for this program?

17-20

Delivery Method

Is this program available on campus and online?

No

This program is available:

On Campus

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

This is a revision of an existing degree program, and for the most part involves only a shift in enrollments of courses currently offered within the Department.

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

For each of these items, be sure to include in the response if the proposed new program or change will result in replacement of another program(s). If so, which program(s), what is the anticipated impact on faculty, students, and instructional resources? Please attach any letters of support/ acknowledgement from faculty, students, and/or other impacted units as appropriate.

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.

Current collections and services are adequate for the proposed program as existing courses from Agriculture & Consumer Economics, Crop Sciences, Economics, Psychology, Sociology, Mathematics, and Educational Psychology are being used in the curricula.

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 the program include other courses/subjects impacted by the creation/revision of this program?

Yes

Required courses

ACE 261 - Applied Statistical Methods
CPSC 241 - Intro to Applied Statistics
ECON 202 - Economic Statistics I
PSYC 235 - Intro to Statistics
SOC 280 - Intro to Social Statistics
EPSY 280 - Elements of Statistics

Explain how the inclusion or removal of the courses/subjects listed above impacts the offering departments.

The Minor program will continue to allow students to choose an introductory course from the current approved list: ACE 261, CPSC 241, ECON 202, EPSY 280, PSYC 235, and SOC 280.
Approval has been granted by the Department of Economics to add ECON 203 to the list of allowable Data Analysis course, as this is a very common minor modification that we already allow students.
Approval has been granted by the Department of Mathematics to add MATH 257, MATH 416, and ASRM 406 to the list of Linear Algebra options which already includes MATH 415.

Attach letters of support from other departments.

Statistics Minor Revision Letters of Support.docx

Financial Resources

How does the unit intend to financially support this proposal?

This is a revision of an existing degree program, and for the most part involves only a shift in enrollments of courses offered within the Department already.

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

No

Program Regulation and Assessment

Briefly describe the plan to assess and improve student learning, including the program's learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student's achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning. (Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable).

The courses in this Minor program are a subset of those within the larger and more rigorous Statistics Major program. The Department will continue to monitor Student Learning Outcomes for courses in this Minor program as outlined in our Assessment Plan filed with the Provost's Office.

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

No

Program of Study

"Baccalaureate degree requires at least 120 semester credit hours or 180 quarter credit hours and at least 40 semester credit hours (60 quarter credit hours) in upper division courses" (source: https://www.ibhe.org/assets/files/PrivateAdminRules2017.pdf). For proposals for new bachelor's degrees, if this minimum is not explicitly met by specifically-required 300- and/or 400-level courses, please provide information on how the upper-division hours requirement will be satisfied.

An undergraduate minor should consist of at least 16 - and no more than 21 hours - of course work, with at least 6 hours of 300- or 400- level courses. Except clearly remedial offerings, prerequisite courses within the sponsoring unit count towards the total; prerequisite courses outside the sponoring unit do not count toward this total. The unit sponsoring the minor and that unit's college may set educationally necessary prerequisites for eligibility for the minor within these constraints. Does this proposal meet these criteria?

Yes

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

Stat Minor Revision April 2021.docx

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

Statement for Programs of Study Catalog

Code	Title	Hours
Select one of the following:		2-3
MATH 125	Elementary Linear Algebra	
Statistics Concepts -Select one of the following:		**3-4**
ACE 261	Applied Statistical Methods	
CPSC 241	Intro to Applied Statistics	
ECON 202	Economic Statistics I	

Code	Title	Hours
EPSY 280	Elements of Statistics	
PSYC 235	Intro to Statistics	
STAT 100	Statistics	
STAT 107	Data Science Discovery	
SOC 280	Intro to Social Statistics	
Data Analysis -Select one of the following:		**3**
STAT 200	Statistical Analysis	
STAT 207	Data Science Exploration	
STAT 212	Biostatistics	
ECON 203	Economic Statistics II	
Linear Algebra -Select one of the following:		**2-3**
MATH 225	Introductory Matrix Theory	
MATH 257	Linear Algebra with Computational Applications	
MATH 415	Applied Linear Algebra	
Select one of the following:		3-4
Mathematical Statistics -Select one of the following:		**3-4**
STAT 400	Statistics and Probability I	
STAT 420	Methods of Applied Statistics	3
Choose one 300- or 400-level course from the list maintained by the department. Please see the Statistics advisor for a current list.		3-4
STAT 408	Actuarial Statistics I	
MATH 461	Probability Theory	
Advanced Statistical Methods[1]		**6**
Select two 300- or 400- level courses froms a list maintained by the Department of Statistics Advising Office. STAT courses numbered 409 and above meet this requirement.		
Total Hours		17-20

[1]   Three courses (9-12 hours), including at least one from the Advanced Statistical methods group, must be STAT courses.

EP Documentation

DMI Documentation

Program Code:

0329

Minor Code

0329

Key: 869

ILLINOIS

Proposal for revised curricula (degree, major, concentration, minor)

Proposal Title: Proposal to revise the curriculum of the Statistics Minor in LAS.

Proposed effective date: Fall 2021

Sponsor(s): David Unger, Director of Undergraduate Programs in Statistics, dunger@illinois.edu

College contact: Kelly Ritter, Associate Dean for Curricula and Academic Policy, College of Liberal Arts and Sciences, ritterk@illinois.edu

For Minors ONLY-
　　　1) Is this minor:
　　　　　o <u>A comprehensive study in a single discipline</u>
　　　　　o An interdisciplinary study focusing on a single theme
　　　　　o Exception

　　　This proposed Minor revision is for a comprehensive study in the single discipline of Statistics.

PROGRAM DESCRIPTION and JUSTIFICATION

1) **Provide a brief description but concise description of your proposal.** For example, if proposing revisions to a curriculum, state specifically what is changing. Where applicable, note whether stated program changes include additional requirements in the form of prerequisite courses. Requests for curriculum revisions must be accompanied by a table which clearly outlines the current requirements and the proposed revisions. This information may be submitted as an appendix. See Appendix A for an example. Please provide pertinent information only.

The proposed revision to the Minor eliminates the two tracks in the current Minor, combining elements of each, in order to both consolidate and streamline overall course options. The proposed Statistics Minor requires a total of 17-20 credit hours, comparable to the 18-21 required hours in the current Applied Statistics track and the 19-20 required hours in the current Mathematical Statistics track. Similar to the current Statistics Minor, the revised requirements allow a student to complete the Minor by completing six courses. Students must complete a minimum of 17 hours, 9-12 hours (3 courses) of which must be in STAT courses.

The Minor revision is further organized by five required areas of competency, which both reflect the converging content of the two existing tracks and make explicit the clusters of requirements present within those: Statistical Concepts, Data Analysis, Linear Algebra, Mathematical Statistics, and Advanced Statistical Methods.

- **Statistical Concepts:** This area will retain the same courses allowed by the current Minor. The revision will also include the newly created STAT 107.
- **Data Analysis:** This area will retain the same courses allowed by the current Minor as well as add ECON 203 and the newly created STAT 207.
- **Linear Algebra:** This area will retain MATH 225 and 415, remove MATH 125, and add MATH 257 (new course), ASRM 406, and MATH 416.
- **Mathematical Statistics:** This area will retain STAT 400, remove ECE 313, and add ASRM 401 and MATH 461.
- **Advanced Statistical Methods:** STAT 420 (Applied Statistics track) and STAT 410 (Mathematical Statistics track) will move from being required to being added to the list of STAT 300- and 400-level allowed as electives.

2) **Provide a justification of the program**, including how your unit decided to create this program, highlights of the program objectives, and the careers, occupations, or further educational opportunities for which the program will prepare graduates, when appropriate.

The revision to the Minor responds to changes in the field of Statistics, to student enrollment patterns, and to necessary incoming skill sets in this area of study. The current Minor has very rigid requirements within each of its two tracks. The proposed revised Minor will eliminate the need to specify tracks, consolidating the two into one cohesive Minor, while at the same time increasing the flexibility of the requirements by allowing more choices within a category, and utilizing new courses that have been recently developed in Statistics and Mathematics. At present, students seeking the Minor are making regular modifications/substitutions to the requirements within each track. The changes in the proposed Minor revision address these typical substitutions.

These changes also add a core that accounts for different student skill sets upon entry to the Minor, allowing for flexible ways to meet the necessary competencies needed for success in the Minor via several different course options. For example, a student with AP or other equivalent credit for STAT 100 will meet the requirement for Statistic Concepts, but will still need to take core courses in the other four areas. Students who want to fulfill core requirements in the five areas with courses outside the Statistics department may also do so in this revision so long as they still complete 9-12 hours in STAT classes within the Minor.

- **Statistical Concepts:** This area will continue to allow a student's first course to come from a variety of departments on campus: ACE 261, CPSC 241, ECON 202, EPSY 280, PSYC 235, STAT 100, and SOC 280. The newly created STAT 107: Data Science Discovery will provide yet another introductory option that hones in on greater computational skill as well.
- **Data Analysis:** STAT 200 and 212 will remain in this area. Just as STAT 212: Biostatistics provides an intermediate course for those wanting an interdisciplinary option, ECON 203: Economic Statistics II will be include to serve one of our largest populations in the Minor – Economics majors. Further, our newly created STAT 207: Data Science Exploration is a natural follow-up to STAT 107.
- **Linear Algebra:** The removal of MATH 125 and addition of MATH 257: Computational Linear Algebra serves to address the changing needs of those in applied statistics by offering more rigorous and computational treatments of linear algebra. ASRM 406 (formerly MATH 410) and MATH 416 are two courses commonly used as substitutions by

students in Actuarial Science and Mathematics. Their inclusion will remove the substitution process and be a more inviting sign to students in those majors.

- **Mathematical Statistics:** As many Statistics minors are Actuarial Science or Mathematics majors, adding ASRM 401 (a.k.a. STAT 408; controlled by Statistics) and MATH 461 will create an easier pathway for those students. Further, those two courses along with STAT 400 comprise the declaration criteria for entry into the Statistics Major. Adding them will bring greater synergy between the Major and Minor programs. ECE 313 is being removed because it does not match the same complete focus on mathematical statistics as the others in this area.
- **Advanced Statistical Methods:** This fifth area requires two advanced 300- or 400-level courses to be completed. With our field and methods ever evolving to meet data needs, allowable electives range in topics including mathematical statistics (e.g., STAT 410, 433), applied statistics (STAT 429, 448), data science (STAT 432, 447), computational statistics (STAT 428, 440), and an all-encompassing focus (STAT 420, 425).

Is this program interdisciplinary?   No

Will specialized accreditation be sought for this program?

No specialized accreditation is being sought

ADMISSION REQUIREMENTS

1) Desired admissions term: *For LAS units, a fall semester effective term for all curricula will be requested, please indicate the proposed year*

Fall,   2021

Is this revision a change to the admission status of the program?   No.

2) 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. (degrees, majors, concentrations ONLY)

Not Applicable for this revision as there are no proposed changes to Admission Requirements

3) Describe how critical academic functions such as admissions and student advising are managed.
Student advising for prospective and current Statistics minor students is achieved by a team of full-time academic advisors within the Department of Statistics. The changes proposed in this revision are not expected to dramatically increase or stretch their obligations with respect to advising our minor students. As students must declare their intent to pursue a minor at the college-level, there is no additional strain to admissions processes.

ENROLLMENT

1) Describe how this revision will impact enrollment and degrees awarded.

Over the past two years, there are an average of 250 students in the minor each semester, and we predict that it will increase to over 300 students over the next three years. This is a prediction based on current trends in our field and not due to any changes being proposed in this Minor revision. However, we believe these changes will positively affect students seeking to complete the Minor and therefore not adversely affect projected enrollment.

2) Estimated Annual Number of Degrees Awarded**(degrees, majors, concentrations ONLY)**

NA, as this revision is for a Minor.

3) What is the matriculation term for this program?   NA

4) Delivery Method, what is the program's primary delivery method?   NA

Face to Face; Online & Face to Face; Online Only; Other- specify

If NOT face to face, please describe the use of this delivery method:

5) MINORS ONLY:

Will the department limit enrollment in the minor?

No

Describe how the department will monitor admission to/enrollment in the minor.

Admission to the Statistics Minor is controlled by the College of Liberal Arts & Sciences. With our department, we will continue to monitor the enrollment status each semester in an attempt to supply our students with enough seats in courses to fulfill the minor requirements.

Are there any prerequisites for the proposed minor?

Any student who completes a Statement of Intent to Pursue a Campus-Approved Minor application will be admitted to the Minor. We will continue to publicize that "Students should have completed the calculus sequence through MATH 241 before entering the minor." This is written in our current catalog entry for the Minor and will not be altered as part of this revision.

Other than certification via the students' degree audits, is there any additional planned mechanism to award/honor successful completion of the minor? If yes, please describe.

No, we are not planning any additional recognition beyond the credential that adjoins a student's certified bachelor's degree. As for certification of the Minor, the student's home college will confirm whether the minor has been completed, based on the coursework designated by the Department of Statistics. If a Minor Modification Form is needed, the College of Liberal Arts and Sciences will review the course substitutions in consultation with the Department of Statistics and approve completion of the Minor with the college of the student.

BUDGET

1) Please describe any budgetary implications for this revision- addressing applicable personnel, facilities, technology and supply costs.

This is a revision of an existing degree program, and for the most part involves only a shift in enrollments of courses currently offered within the Department.

2) Will the revision require staffing (faculty, advisors, etc.) beyond what is currently available? If yes, please describe.

No.

3) Please provide any additional budget information needed to effectively evaluate the proposal.

Not Applicable

RESOURCE IMPLICATIONS

1) Facilities- Will the program require new or additional facilities or significant improvements to already existing facilities? If yes, please outline the specific need and Year 1 and Year 5 cost.

No.

2) Technology- Will the program need additional technology beyond what is currently available for the unit? If yes, please outline the specific need and Year 1 and Year 5 cost.

No.

3) Non-Technical Resources- Will the program require additional supplies, services or equipment (non-technical)? If yes, please outline the specific need and Year 1 and Year 5 cost.

No.

RESOURCES

1) 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.

No changes in the number of faculty are needed.

2) 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.

There is no expected impact on the University Library.

3) 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? If yes, please describe.

We will not be reducing the number of offerings of any STAT course as a result of the revision to the Statistics Minor.

4) Does this new program/proposed change result in the replacement of another program? If yes, please specify the program.

No.

5) Does the program include any required or recommended subjects that are offered by other departments? If yes, please list the courses. Explain how these additional courses will be used by the program and provide letters of support from the departments.

Yes. The Minor program will continue to allow students to choose an introductory course from the current approved list: ACE 261, CPSC 241, ECON 202, EPSY 280, PSYC 235, and SOC 280.

Approval has been granted by the Department of Economics to add ECON 203 to the list of allowable Data Analysis course, as this is a very common minor modification that we already allow students.

Approval has been granted by the Department of Mathematics to add MATH 257, MATH 416, and ASRM 406 to the list of Linear Algebra options which already includes MATH 415.

FINANCIAL RESOURCES

1) How does the unit intend to financially support this proposal?

This is a revision of an existing degree program, and for the most part involves only a shift in enrollments of courses offered within the Department already.

2) Will the unit need to seek campus or other external resources? If yes, please provide a summary of the sources and an indication of the approved support.

No.

3) Will an existing tuition rate be used or continue to be used for this program? (degrees, majors, concentrations ONLY)

There are no proposed changes to the existing tuition rate.

PROGRAM REGULATION

1) **Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable.**
Briefly describe the plan to assess and improve student learning, including the program's learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student's achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning.

The courses in this Minor program are a subset of those within the larger and more rigorous Statistics Major program. The Department will continue to monitor Student Learning Outcomes for courses in this Minor program as outlined in our Assessment Plan filed with the Provost's Office.

2) Is the career/profession for graduates of this program regulated by the State of Illinois? If yes, please describe.

No.

ACADEMIC CATALOG ENTRY

1) All proposals must submit the major requirements (courses, hours) for the proposed curricula. Please see the University of Illinois Academic Catalog- http://catalog.illinois.edu/ for your unit for an example of the entry.

The contact information may remain as is, except for the email. See below.

department website: https://stat.illinois.edu/
department faculty: Statistics Faculty

overview of college admissions & requirements: Liberal Arts & Sciences
college website: https://las.illinois.edu/

email: stat-advising@illinois.edu

The program description has a few modest changes from how it currently reads in the catalog. Please use the following.

The minor, administered by the Department of Statistics, is designed to provide students with an understanding of the concepts of statistical inference and a familiarity with the methods of applied statistical analysis. With the prevalence of data in all fields of study, a minor in statistics will assist students with their primary major and better prepare them for the analysis-related duties of their future career. It will also prepare students for the statistical and data analysis requirements that supplement the graduate studies of their chosen field. Interested students should contact the Statistics Advising office with any questions. Students should have completed the calculus sequence through MATH 241 before entering the minor.

2) Include a comparative table of the current and proposed requirements.

Current curricula (two tracks) and proposed revisions (one unified Minor; no tracks) are listed below. The comparison between the current and proposed requirements is only provided side-by-side for the current Applied Statistics track. The comparison is not duplicated for the Mathematical Statistics track. We choose to provide the comparison between the proposed revision and the current Applied Statistics track because it provides greater alignment in representing the changes and because the Applied Statistics track has been the overwhelming favorite among those who have completed the Statistics Minor in recent years.

Those additions to the program are highlighted in yellow. The movement of courses from required core to one of several electives are highlighted in green. A deletion from the program is highlighted in blue.

Comparative Table of Proposed Changes

Current Requirements	Current Hours	Proposed Requirements	Proposed Hours
PROGRAM TOTAL	18-21	PROGRAM TOTAL	17-20
APPLIED STATISTICS TRACK	18-21		
Select one of the following: STAT 100: Statistics ACE 261: Applied Statistical Methods CPSC 241: Intro to Applied Statistics ECON 202: Economic Statistics I EPSY 280: Elements of Statistics PSYC 235: Intro to Statistics SOC 280: Intro to Social Statistics	3-4	**Statistics Concepts** Select one of the following: STAT 100: Statistics STAT 107: Data Science Discovery ACE 261: Applied Statistical Methods CPSC 241: Intro to Applied Statistics ECON 202: Economic Statistics I EPSY 280: Elements of Statistics PSYC 235: Intro to Statistics SOC 280: Intro to Social Statistics	3-4
STAT 200: Statistical Analysis, or	3	**Data Analysis** Select one of the following: STAT 200: Statistical Analysis	3

STAT 212: Biostatistics		STAT 207: Data Science Exploration STAT 212: Biostatistics ECON 203: Economic Statistics II	
Select one of the following: MATH 125: Elementary Linear Algebra MATH 225: Introductory Matrix Theory MATH 415: Applied Linear Algebra	2-3	**Linear Algebra** Select one of the following: MATH 225: Introductory Matrix Theory MATH 257: Linear Algebra with Computational Applications MATH 415: Applied Linear Algebra	2-3
STAT 400: Statistics & Probability I	4	**Mathematical Statistics** Select one of the following: ASRM 401: Actuarial Statistics I STAT 400: Statistics & Probability I MATH 461: Probability Theory	3-4
STAT 420: Methods of Applied Statistics	3	**Advanced Statistical Methods** Select two 300- or 400- level courses from a list maintained by the Department of Statistics Advising office. STAT courses numbered 409 and above meet this requirement.	6
Choose one 300- or 400-level course from the list maintained by the department. Please see the Statistics advisor for a current list.	3-4	Three courses (9-12 hours), including at least one from the Advanced Statistical Methods group, must be STAT courses.	
MATHEMATICAL STATISTICS TRACK	**19-20**		
MATH 415: Applied Linear Algebra	3-4		
STAT 200: Statistical Analysis, or STAT 212: Biostatistics	3		
STAT 400: Statistics & Probability I	4		
STAT 410: Statistics & Probability II, or ECE 313: Probability with Engrg Applic	3		
Choose two 300- or 400-level course from the list maintained by the department. Please see the Statistics advisor for a current list.	6		
PROGRAM TOTAL	**18-21**	**PROGRAM TOTAL**	**17-20**

Appendix A: List of Courses Accepted for Advanced Statistical Methods requirement

- STAT 385   Statistics Programming Methods
- Either STAT 409/ASRM 402   Actuarial Statistics II (if STAT 408/ASRM 401 or MATH 461 is completed)
  or STAT 410/MATH 464   Statistics and Probability II (if STAT 400 is completed)
- Either STAT 420/ASRM 450   Methods of Applied Statistics (recommended)
  or STAT 425   Statistical Modeling I
- STAT 424   Analysis of Variance
- STAT 426   Statistical Modeling II
- STAT 427   Statistical Consulting
- STAT 428   Statistical Computing
- STAT 429   Time Series Analysis
- STAT 430*   Topics in Applied Statistics
- STAT 431   Applied Bayesian Analysis
- STAT 432/ASRM 451   Basics of Statistical Learning
- STAT 433   Stochastic Processes
- STAT 434   Survival Analysis
- STAT 440   Statistical Data Management
- STAT 443   Professional Statistics
- STAT 447   Data Science Programming Methods
- STAT 448   Advanced Data Analysis
- STAT 480   Data Science Foundations

* STAT 430 may be repeated for fulfillment of the Advanced Statistical Methods requirement if the topics differ.

STAT courses numbered 409 and above meet this requirement. Courses with a statistical focus at the 300- or 400-level offered by other departments may be accepted as satisfactory for this requirement pending a review of a current syllabus supplied to the Statistics Advising office. Students are encouraged to contact stat-advising@illinois.edu with questions and to submit syllabi of potential courses.

Appendix B: Letters of Support

<u>ECONOMICS</u>

The Department of Statistics has prepared a revision to our Statistics Minor. ECON 202: Economics Statistics I currently resides and will continue to be on a list of allowed introductory statistics courses. ECON 203: Economics Statistics II is a course that many students complete to satisfy the intermediate Data Analysis requirement and we oblige them via the Minor Modification form.

If you are amenable to this, we would like to include ECON 203 as a formal inclusion to the list of allowed courses in that group (along with STAT 200, 207, and 212). We think that this would be very accommodating to many students, especially your Economics majors who also pursue the Statistics Minor. If you are in support of ECON 203 being among the Stat Minor curricula, would you please be willing to provide a letter of support for us to include with the revision?

Thank you for your consideration.
-David

David Unger
Director of Undergraduate Programs
Department of Statistics
University of Illinois at Urbana-Champaign

Dear David,

Thank you for the clarification.

We are willing to support the revision along the lines you have described. If a formal letter would be required, then we will provide it. Let's first try to see whether this email would suffice.

With best regards,

George

GEORGE DELTAS
Professor, and Department Head

University of Illinois at Urbana-Champaign

Department of Economics
214E David Kinley Hall
1407 W Gregory Dr | M/C 707
Urbana, IL 61801
217.333.4678 | deltas@illinois.edu

ELECTRICAL AND COMPUTER ENGINEERING

Dear Erhan,

We are preparing a proposal for a revised minor degree in statistics. Previously we had listed either STAT 410 or ECE 313 as required for the Mathematical Track of the minor. The revised minor no longer requires a second course in mathematical statistics and probability, so we would like your permission to remove ECE 313 from the degree requirements.

Dept of Statistics has the permission of ECE to remove ECE 313 as proposed from the revised Stat minor requirements.

Best regards,

Erhan

Erhan Kudeki Tel: 217 265 0128 erhan@illinois.edu
Professor and Associate Head for Undergraduate Affairs
Department of Electrical and Computer Engineering
University of Illinois at Urbana-Champaign
2080 ECEB, 306 N. Wright St., Urbana, IL 61801

MATHEMATICS

Re: Use of Math 257 in Statistics

The Mathematics Department, working with the Grainger College of Engineering, has recently created the course MATH 257, *Linear Algebra with Computational Applications*. Quoting from the justification of the approved proposal, "In the future, MATH 257 will replace the MATH 415 requirement in many science and engineering curricula." With this in mind, the department would be pleased to have Statistics add MATH 257 as an option to MATH 415 in their program, specifically in their Statistics BS, Statistics & Computer Science BS as well as in their Statistics minor. As the Mathematics department is reallocating instructional resources from Math 415 to Math 257 as the need shifts, this will not cause any undue difficulties for Mathematics resources.

Sincerely

Randy McCarthy

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

Re: Use of Math 461 in the Statistics Minor

The Mathematics Department would be delighted to have Math 461 included as an option in the proposed Statistics Minor. There is ample capacity in our courses to accommodate any projected interest caused by including this option.

Sincerely

Randy McCarthy

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

Appendix C: Mock-up of how the proposed revisions would possibly appear in the Catalog.

     department website: https://stat.illinois.edu/
     department faculty: Statistics Faculty

     overview of college admissions & requirements: Liberal Arts & Sciences
     college website: https://las.illinois.edu/

     email: stat-advising@illinois.edu

The minor, administered by the Department of Statistics, is designed to provide students with an understanding of the concepts of statistical inference and a familiarity with the methods of applied statistical analysis. With the prevalence of data in all fields of study, a minor in statistics will assist students with their primary major and better prepare them for the analysis-related duties of their future career. It will also prepare students for the statistical and data analysis requirements that supplement the graduate studies of their chosen field. Interested students should contact the Statistics Advising office with any questions. Students should have completed the calculus sequence through MATH 241 before entering the minor.

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Statistics Concepts: Select one of the following.		3-4
STAT 100	Statistics	
STAT 107	Data Science Discovery	
ACE 261	Applied Statistical Methods	
CPSC 241	Intro to Applied Statistics	
ECON 202	Economic Statistics I	
EPSY 280	Elements of Statistics	
PSYC 235	Intro to Statistics	
SOC 280	Intro to Social Statistics	
Data Analysis: Select one of the following.		3
STAT 200	Statistical Analysis	
STAT 207	Data Science Exploration	

STAT 212	Biostatistics	
ECON 203	Economic Statistics I	
Linear Algebra: Select one of the following.		2-3
MATH 225	Introductory Matrix Theory	
MATH 257	Linear Algebra with Computational Applications	
MATH 415	Applied Linear Algebra	
Mathematical Statistics: Select one of the following.		3-4
STAT 408	Actuarial Statistics I	
STAT 400	Statistics and Probability I	
MATH 461	Probability Theory I	
Advanced Statistical Methods: [1]		6
Select two 300- or 400- level courses from a list maintained by the Department of Statistics Advising office. STAT courses numbered 409 and above meet this requirement.		
Total Hours[1]		**17-20**

1. Three courses (9-12 hours), including at least one from the Advanced Statistical Methods group, must be STAT courses.

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Erhan

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Professor and Associate Head for Undergraduate Affairs
Department of Electrical and Computer Engineering
University of Illinois at Urbana-Champaign
2080 ECEB, 306 N. Wright St., Urbana, IL 61801

MATHEMATICS

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Department of Mathematics

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

Re: Use of Math 257 in Statistics

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Sincerely

Randy McCarthy

Randy McCarthy
Professor of Mathematics
Dir of Undergraduate Studies in Math
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telephone 217-333-3350 • *fax* 217-333-9576
email office@math.uiuc.edu • *url* http://www.math.uiuc.edu/

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Department of Mathematics

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