Idaho State Board of Education
Proposal for **Undergraduate/Graduate Degree** Program

Date of Proposal Submission:	
Institution Submitting Proposal:	University of Idaho
Name of College, School, or Division:	College of Science
Name of Department(s) or Area(s):	Statistical Science

Program Identification for Proposed New or Modified Program:

Program Title:	BS Statistics				
Degree:	BS	Degree Designation	X	Undergraduate	Graduate
Indicate if Online Program:		Yes		No X	
CIP code (consult IR /Registrar):	27.0501 General Statistics				
Proposed Starting Date:	Summer 2018				
Geographical Delivery:	Location(s)	Moscow, ID	Region(s)	II	
Indicate (X) if the program is/has:		Self-Support		Professional Fee	
Indicate (X) if the program is:	x	Regional Responsibility		Statewide Responsibility	

Indicate whether this request is either of the following:

X	New Degree Program	☐	Consolidation of Existing Program
☐	Undergraduate/Graduate Certificates (30 credits or more)	☐	New Off-Campus Instructional Program
☐	Expansion of Existing Program	☐	Other (i.e., Contract Program/Collaborative

College Dean (Institution)	Date	Vice President for Research (Institution; as applicable)	Date
Graduate Dean or other official (Institution; as applicable)	Date	Academic Affairs Program Manager, OSBE	Date
FVP/Chief Fiscal Officer (Institution)	Date	Chief Academic Officer, OSBE	Date
Provost/VP for Instruction (Institution)	Date	SBOE/Executive Director Approval	Date
President	Date		

> **Before completing this form, refer to Board Policy Section III.G., Postsecondary Program Approval and Discontinuance**. This proposal form must be completed for the creation of each new program. All questions must be answered.

Rationale for Creation or Modification of the Program

1. **Describe the request and give an overview of the changes that will result.** Will this program be related or tied to other programs on campus? Identify any existing program that this program will replace.

   We are proposing creation of a Bachelor of Science degree in Statistics in the Department of Statistical Science. This degree will have two options: the General option and the Actuarial Science option. The Actuarial Science option is being directly transferred from the option of the same name from the BS in Mathematics, while the General option will be similar to the Applied Statistics option in the BS Mathematics degree, with curricular changes. We are essentially planning to transfer two options in the current BS in Mathematics to create a BS in Statistics. This move will give the degree a higher profile, more flexibility, and will move it into the department where it most naturally resides and where advisors are experts in the area and understand course content and appropriateness for career and future goals for students.

2. **Need for the Program**. Describe the student, regional, and statewide needs that will be addressed by this proposal and address the ways in which the proposed program will meet those needs.

   *These two degree options have good graduation numbers as options within the BS degree in Mathematics. Given more visibility and tailored to the needs of data-rich fields, the degree will meet an important demand in many fields. The field of Statistics is a major part of emerging areas such as Data Science and Analytics. As noted in the market analysis by Hanover, "… **statistics graduates will require a broader range of skills**" to fill future Data Science positions. The newly configured General option will be very flexible, allowing students to acquire a variety of skills. Having faculty from the Department of Statistical Science direct this degree will open new possibilities for students in the areas of undergraduate research and the ability to tailor the degree to their interests.*

   a. **Workforce need:** Provide verification of state workforce needs that will be met by this program. Include State and National Department of Labor research on employment potential. Using the chart below, indicate the total projected annual job openings (including growth and replacement demands in your regional area, the state, and nation. Job openings should represent positions which require graduation from a program such as the one proposed. Data should be derived from a source that can be validated and must be no more than two years old.

      List the job titles for which this degree is relevant:

      1. *Statistician*
      2. *Actuary (for the Actuarial Science option)*
      3. *Insurance Underwriter*
      4. *Data Analyst*
      5. *Data Scientist*
      6. *Statistical Programmer*

7. *Survey Researcher*
8. *Mathematician*
9. *Any other fields where data is used*

	State DOL data	Federal DOL data	Other data source: (describe)
Local (Service Area)			Regionally, 240/year a
State	21 /year b		
Nation		1640/year c, d, e	f, g

Provide (as appropriate) additional narrative as to the workforce needs that will be met by the proposed program.

   a. *From the market analysis by Hanover, by selecting the occupations 'Actuary,' 'Statistician,' Insurance Underwriter', and' 'Survey Researcher' which were used in their report. However there are many other job titles that pertain to this degree, such as Data Scientist, Data Analyst, and Statistical Programmer.*
   b. *The State DOL data was obtained by selecting the occupations 'Actuary,' 'Statistician,' Insurance Underwriter', and' 'Survey Researcher' which were used in the external report by Hanover Research. However there are many other job titles that pertain to this degree, such as Data Scientist, Data Analyst, and Statistical Programmer.*
   c. *using https://www.bls.gov/ooh/math/statisticians.htm and*
   d. *https://www.bls.gov/ooh/math/actuaries.htm and*
   e. *https://www.bls.gov/ooh/life-physical-and-social-science/survey-researchers.htm In each case the 10 year job change was divided by 10 to obtain a yearly change.*
   f. *Many surveys of best careers include both Statisticians and Actuaries. For example, Careercast.com's report on the best jobs of 2016 (http://www.careercast.com/jobs-rated/jobs-rated-report-2016-ranking-200-jobs) has Data Scientist as #1, Statistician as #2, and Actuary as #10.*
   g. *Statisticians are listed as one of the five fastest growing occupations requiring a Bachelor's degree or higher, https://www.bls.gov/emp/images/top_occupations.jpg*

b. **Student need.** What is the most likely source of students who will be expected to enroll (full-time, part-time, outreach, etc.). Document student demand by providing information you have about student interest in the proposed program from inside and outside the institution. If a survey of s was used, please attach a copy of the survey instrument with a summary of results as **Appendix A.**

Initially these two options will have enrollment numbers similar to the analogous options for the BS degree in Mathematics. With greater visibility and tailoring of the General option for Data Science and other applications, enrollment should grow. Nationally, the bachelor's degree in statistics is one of the fastest growing majors, with a 40% growth between 2009 and 2011 (http://magazine.amstat.org/blog/2013/05/01/stats-degrees/) .

c. **Economic Need**: Describe how the proposed program will act to stimulate the state economy by advancing the field, providing research results, etc.

More and more data is being collected in many fields. The demand for graduates who are trained to understand these data sets will grow. Each year representatives and recruiters come to the University of Idaho and request to meet with our Actuarial Science and Statistics majors as they are looking to hire and have hired our graduates in the past.

    d. Societal Need: Describe additional societal benefits and cultural benefits of the program.

Statisticians are in demand in virtually every field to understand information, from both large and small data sets. Societal benefits accrue from the proper collection and accurate reporting of data, and cultural benefits can come from, for example, being able to accurately report information to citizens and stakeholders.

    e. If Associate's degree, transferability:
    N/A

3. Similar Programs. Identify similar programs offered within Idaho and in the region by other in-state or bordering state colleges/universities.

Using data from the external report by Hanover Research:

Similar Programs offered <u>by Idaho public institutions</u> (list the proposed program as well)		
Institution Name	**Degree name and Level**	**Program Name and brief description if warranted**
University of Idaho	**B.S. in Statistics**	**Proposed program**
Idaho State University	**B.S. in Statistics**	**Department of Mathematics and Statistics**

Similar Programs offered <u>by other Idaho institutions and by institutions in nearby states</u>		
Institution Name	**Degree name and Level**	**Program Name and brief description if warranted**
University of Northern Colorado	**B.S. Mathematics, Applied Statistics**	**School of Mathematical Sciences**
Montana State University	**Mathematical Sciences, Statistics option**	**Department of Mathematical Sciences**
University of Montana	**B.A. Mathematics, Statistics option**	**Department of Mathematical Sciences**
Washington State	**B.S. Mathematics, Actuarial Science**	**Department of Mathematics and Statistics**

University	option	
University of Wyoming	B.S./B.A. Statistics	Department of Statistics
BYU Idaho	Bachelor's in Mathematical Sciences with Applied Statistics emphasis	Department of Mathematics

4. **Justification for Duplication with another institution listed above.** (if applicable). If the proposed program is similar to another program offered by an Idaho public institution, provide a rationale as to why any resulting duplication is a net benefit to the state and its citizens. Describe why it is not feasible for existing programs at other institutions to fulfill the need for the proposed program.

   The Applied Statistics and Actuarial Science options have existed within the B.S. in Mathematics at the University of Idaho for many years, so there is no new duplication from this proposal.

5. **Describe how this request supports the institution's vision and/or strategic plan.**

   Our vision statement describes where the university plans to arrive within the next decade: "The University of Idaho will expand the institution's intellectual and economic impact and make higher education relevant and accessible to qualified students of all backgrounds." Virtually every field of study needs people with statistical skills, and our ability to provide degrees in this field aligns with our institutional mission of economic impact. Regarding the strategic plan, this new program will provide new opportunities for students to engage in undergraduate research (Strategic Plan Goal 1).

6. **Assurance of Quality.** Describe how the institution will ensure the quality of the program. Describe the institutional process of program review. Where appropriate, describe applicable specialized accreditation and explain why you do or do not plan to seek accreditation.

   External Program Review, along with ongoing annual planning and academic outcomes assessment are steps to ensure quality of the program. Although there is no specialized accreditation process for Statistics programs, External Program Reviews are conducted on a seven-year cycle and academic outcomes assessments occur annually.

7. **In accordance with Board Policy III.G., an external peer review is required for any new doctoral program.** Attach the peer review report as **Appendix B**.

8. **Teacher Education/Certification Programs** All Educator Preparation programs that lead to certification require review and recommendation from the Professional Standards Commission (PSC) and approval from the Board.

   Will this program lead to certification?

Yes_____ No__X___

If yes, on what date was the Program Approval for Certification Request submitted to the Professional Standards Commission?

9. **Five-Year Plan: Is the proposed program on your institution's approved 5-year plan? Indicate below.**

   Yes _X_ No _____

   Proposed programs submitted to OSBE that are not on the five-year plan must respond to the following questions and meet <u>at least one criterion listed below</u>.

   a. **Describe why the proposed program is not on the institution's five year plan.** When did consideration of and planning for the new program begin?

   b. **Describe the immediacy of need for the program**. What would be lost were the institution to delay the proposal for implementation of the new program until it fits within the five-year planning cycle? What would be gained by an early consideration?

   Criteria. As appropriate, discuss the following:

   i. How important is the program in meeting your institution's regional or statewide program responsibilities? Describe whether the proposed program is in response to a specific industry need or workforce opportunity.
   ii. Explain if the proposed program is reliant on external funding (grants, donations) with a deadline for acceptance of funding.
   iii. Is there a contractual obligation or partnership opportunity to justify the program?
   iv. Is the program request or program change in response to accreditation requirements or recommendations?
   v. Is the program request or program change in response to recent changes to teacher certification/endorsement requirements?

Curriculum, Intended Learning Outcomes, and Assessment Plan

10. **Curriculum for the proposed program and its delivery.**

    a. **Summary of requirements.** Provide a summary of program requirements using the following table.

Credit hours in required courses offered by the department (s) offering the program.	24 – 39
Credit hours in required courses offered by other departments:	14 - 33
Credit hours in institutional general education curriculum	36
Credit hours in free electives	32 - 36
Total credit hours required for degree program:	120

The range of credits required in Statistics as well as in other departments varies according to student interests. Four elective courses are required in the General option, and they can be all from Statistics, or all from Mathematics, or mostly in computer science courses in several departments. The likely net effect of this reconfigured Statistics General option in comparison to the Statistics option currently in the BS degree in Mathematics should be that some more credit hours occur in Statistics courses that formerly were in Mathematics courses.

b. **Additional requirements.** Describe additional requirements such as comprehensive examination, senior thesis or other capstone experience, practicum, or internship, some of which may carry credit hours included in the list above.

A Senior Experience course is required of all majors. We will create a Senior Experience course for Statistics majors to enable them to work in teams to collect, process, and analyze data for research studies. This will be a three-credit course.

11. **Program Intended Learning Outcomes and Connection to Curriculum.**

a. **Intended Learning Outcomes.** List the Intended Learning Outcomes for the proposed program, using learner-centered statements that indicate what will students know, be able to do, and value or appreciate as a result of completing the program.

1. *The student can apply fundamental theory in probability and statistical inference.*
2. *The student can apply and evaluate statistical models.*
3. *The student can apply statistical computing skills for data analysis and data science.*
4. *The student has developed effective communication skills.*

12. **Assessment plans**

a. **Assessment Process.** Describe the assessment process that will be used to evaluate how well students are achieving the intended learning outcomes of the program.

Our assessment plan will align the learning outcomes with specific courses in the program. From the set of learning outcomes shown above, LO 1 would align with skills from Math 451 and Stat 452, LO 2 aligns with skills from Stat 422 and Stat 437, LO 3 aligns with skills from Stat 426 and Stat 427, and LO 4 aligns with skills developed in projects in several courses as well as the Senior Experience course. Specific exam questions and project outcomes could be used to measure LO attainment. We already have a similar system in place for assessment of our MS degree. Exam questions and projects will be selected and data will be collected yearly for each outcome. Instructors of these courses will select exam questions and/or projects and present findings in our yearly faculty meeting on assessment. Initially we will collect data on all students in the major, and we may consider sampling students as the program grows. We will start with a set of benchmarks similar to those in our MS program (e.g. At least 70% of majors have a satisfactory score on the given exam questions/projects), and consider adjustments as we collect more data.

b. **Closing the loop.** How will you ensure that the assessment findings will be used to improve the program?

Yearly evaluation of direct and indirect measures will point out areas that can benefit

from improvement. As outlined above, learning outcomes are mostly aligned with specific courses. If benchmarks are not attained for a specific learning outcome, the faculty will discuss this at our annual meeting on assessment. The instructors of LO-aligned courses will play an important role in these discussions. If benchmarks for a particular outcome are not attained, then faculty discussion may lead to the suggestion that more time be spent on particular topics, or that they be presented in different ways in aligned courses, for example.

c. **Measures used.** What direct and indirect measures will be used to assess student learning?

As mentioned above, measures would come from courses aligned with specific learning outcomes. For LO's 1 – 3, our initial direct measures would come from selected exam questions in the aligned course as indicated above. For LO 4, a direct measure could come from student work in the Senior Experience course, or based on the student's ability to explain findings in a written report or oral presentation in courses such as Stat 437: Design of Experiments. Our initial indirect measures for each LO will come from exit interviews, with more indirect measures to be possibly added later.

d. **Timing and frequency**. When will assessment activities occur and at what frequency?

We plan to assess all LOs on a yearly basis. Most of these courses are taught once per year, so some outcomes would have data collected in the Fall semester while others would have data collected in the Spring semester. The yearly faculty assessment meeting will occur either in late Spring or early Fall. Changes to the program suggested by assessment results can then be implemented in courses the next time they are taught.

Enrollments and Graduates

13. **Existing similar programs at Idaho Public Institutions.** Using the chart below, provide enrollments and numbers of graduates for similar existing programs at your institution and other Idaho public institutions.

Existing Similar Programs: Historical enrollments and graduate numbers								
Institution and Program Name	**Fall Headcount Enrollment in Program**				**Number of Graduates From Program (Summer, Fall, Spring)**			
	FY12	FY13	FY14	FY15 (most recent)	FY12	FY13	FY14	FY15 (most recent)
BSU								
ISU					2	2	7	4

UI	34	34	39	31	4	10	9	9
LCSC								

14. **Projections for proposed program:** Using the chart below, provide projected enrollments and number of graduates for the proposed program:

Proposed Program: Projected Enrollments and Graduates First Five Years											
Program Name:											
Projected Fall Term Headcount Enrollment in Program						**Projected Annual Number of Graduates From Program**					
FY19 (first year)	FY20	FY21	FY22	FY23	FY24	FY19 (first year)	FY20	FY21	FY22	FY23	FY24
31	35	40	45	50	55	7	8	10	11	12	14

15. **Describe the methodology for determining enrollment and graduation projections.** Refer to information provided in Question #2 "Need" above. What is the capacity for the program? Describe your recruitment efforts? How did you determine the projected numbers above?

   The initial enrollment projections are based on the number of students in the existing options in the B.S. degree in Mathematics. Future projections are based on assuming modest increases over time, which seems reasonable given the increasing numbers nationally. Enrollment increases will fit within existing course capacity for the first several years. Beyond the first several years a few courses may need an extra section each year. Initial recruitment efforts will be to create a brochure describing the new degree and its options to be used in College of Science recruiting events.

16. **Minimum Enrollments and Graduates.** Have you determined minimums that the program will need to meet in order to be continued? What are those minimums, what is the logical basis for those minimums, what is the time frame, and what is the action that would result?

   Versions of these two options currently exist as options in the BS degree in Mathematics. Those options, with edits, will become the two options in this new BS degree in Statistics. Thus there is already a record of steady enrollment in these options, which will increase as the General option in the BS Statistics degree attracts a more diverse population of students. Even if these two options were to suddenly suffer a drop in enrolled students (reversing the steady enrollments of at least 15 years and at odds with national trends), almost all of the actual courses offered by Statistics faculty would still be needed for other programs across campus. For example, the Stat 507 Experimental Design course (which will now be joint listed as Stat 437/507) has 21 students in Fall 2017, only five of whom are in undergraduate or

graduate Statistics programs. If both degree options were to suffer sustained drops, the senior experience course that we will create would discontinue if the BS degree were discontinued, but those are the only likely curricular actions that would result.

Resources Required for Implementation – fiscal impact and budget

17. <mark>Physical Resources</mark>.

    a. **Existing resources**. Describe equipment, space, laboratory instruments, computer(s), or other physical equipment presently available to support the successful implementation of the program.
    b.
       Our current space should be sufficient, since this degree is replacing existing degree options.

    c. **Impact of new program**. What will be the impact on existing programs of increased use of physical resources by the proposed program? How will the increased use be accommodated?

       No additional impact is expected.

    d. **Needed resources.** List equipment, space, laboratory instruments, etc., that must be obtained to support the proposed program. Enter the costs of those physical resources into the budget sheet.

       A small amount of money will be needed to provide support for recruiting, undergraduate research, having a Statistics club, and other student activities. According to our calculations, a small increase in enrollment would more than pay for this additional support if funds are reallocated to the department.

18. <mark>Library resources</mark>

    a. **Existing resources and impact of new program**. Evaluate library resources, including personnel and space. Are they adequate for the operation of the present program? Will there be an impact on existing programs of increased library usage caused by the proposed program? For off-campus programs, clearly indicate how the library resources are to be provided.

       The library resources at the University of Idaho are adequate. There should be very little impact as this degree is similar to the options is would replace.

    b. **Needed resources**. What new library resources will be required to ensure successful implementation of the program? Enter the costs of those library resources into the budget sheet.

       Existing resources should be adequate.

19. <mark>Personnel resources</mark>

a. **Needed resources.** Give an overview of the personnel resources that will be needed to implement the program. How many additional sections of existing courses will be needed? Referring to the list of new courses to be created, what instructional capacity will be needed to offer the necessary number of sections?

   Our proposed budget (outlined on the Budget spreadsheet) requests a modest amount of funding for two objectives .The first objective is for Statistics to take over funding for Math 455, which is a course taught to Actuarial Science students. Currently Mathematics provides funding to staff the course. The second objective is funding to support creation of a Statistics capstone course, which will entail buying out a faculty member from a different course. The Statistics capstone course is expected to be highly interdisciplinary and may attract students from multiple majors. **Existing resources**. Describe the existing instructional, support, and administrative resources that can be brought to bear to support the successful implementation of the program.*

   Existing instructional, support, and administrative resources should be adequate for everything except the three funding objectives listed above.

b. **Impact on existing programs**. What will be the impact on existing programs of increased use of existing personnel resources by the proposed program? How will quality and productivity of existing programs be maintained?

   This program would likely lead to enrollment increases in several Statistics courses, but these courses could accommodate projected increases for at least the first three or four years, at which point one or two new sections may be needed.

c. **Needed resources.** List the new personnel that must be hired to support the proposed program. Enter the costs of those personnel resources into the budget sheet.

   Our proposal lists only resources to offer one new course (a capstone course) and to take over funding for an existing course (Math 455). With the proposed increased funding, personnel can be identified to cover these courses.

20. <mark>Revenue Sources</mark>

   a) **Reallocation of funds:** If funding is to come from the reallocation of existing state appropriated funds, please indicate the sources of the reallocation. What impact will the reallocation of funds in support of the program have on other programs?

   A funding source will need to be identified, but anticipated enrollment increases will more than pay for this funding if a portion of the revenue is allocated to the department

   b) **New appropriation**. If an above Maintenance of Current Operations (MCO) appropriation is required to fund the program, indicate when the institution plans to include the program in the legislative budget request.

   Unknown.

   c) **Non-ongoing sources**:
      i. If the funding is to come from one-time sources such as a donation, indicate the sources of other funding. What are the institution's plans for sustaining the program

when that funding ends?

ii.   Describe the federal grant, other grant(s), special fee arrangements, or contract(s) that will be valid to fund the program. What does the institution propose to do with the program upon termination of those funds?

NA

d) **Student Fees**:

i.   If the proposed program is intended to levy any institutional local fees, explain how doing so meets the requirements of Board Policy V.R., 3.b.

ii.   Provide estimated cost to students and total revenue for self-support programs and for professional fees and other fees anticipated to be requested under Board Policy V.R., if applicable.

General degree costs: For a degree completed in 4 years:
   Idaho Residents: $28,928
   Non-Idaho Residents: $88,160
   Additional Web-based courses: ~$210 Stat 251 or 301, Stat 431.

21.   Using the <u>budget template</u> provided by the Office of the State Board of Education, provide the following information:

- Indicate all resources needed including the planned FTE enrollment, projected revenues, and estimated expenditures for the first **four** fiscal years of the program.

- Include reallocation of existing personnel and resources and anticipated or requested new resources.

- Second and third year estimates should be in constant dollars.

- Amounts should reconcile subsequent pages where budget explanations are provided.

- If the program is contract related, explain the fiscal sources and the year-to-year commitment from the contracting agency(ies) or party(ies).

- Provide an explanation of the fiscal impact of any proposed discontinuance to include impacts to faculty (i.e., salary savings, re-assignments).

Statistics B.S.

Basic Courses (14 cr)

MATH 170	Analytic Geometry and Calculus I	4 cr
MATH 175	Analytic Geometry and Calculus II	4 cr
MATH 275	Analytic Geometry and Calculus III	3 cr
MATH 330	Linear Algebra	3 cr

A. General Option

Statistics Courses (21 cr)

STAT 301	Probability and Statistics	3 cr
STAT 422	Sample Survey Methods	3 cr
STAT 431	Statistical Analysis	3 cr
STAT 436	Applied Regression Modeling	3 cr
STAT 437	Experimental Design	3 cr
STAT 451	Probability Theory	3 cr
STAT 452	Mathematical Statistics	3 cr

Computer Courses (6 cr):

CS 120	Computer Science I	4 cr
STAT 427	R Programming	3 cr
STAT 426	SAS Programming	3 cr
Other approved Courses		

Major Electives (12 cr):

CS 479	Data Science	3 cr
MATH 310	Ordinary Differential Equations	3 cr
MATH 428	Numerical Methods	3 cr
MATH 437	Mathematical Biology	3 cr
MATH 438	Mathematical Modeling	3 cr
MATH 471	Introduction to Analysis I	3 cr
MIS 455	Data Management for Big Data	3 cr
MIS 555	Data Management for Big Data	3 cr
STAT 456	Quality Management	3 cr
STAT 535	Intro to Bayesian Statistics	3 cr
STAT 514	Nonparametric Statistics	3 cr
STAT 517	Statistical Learning & Predictive Modeling	3 cr

Capstone (3 cr):

MATH 415	Cryptography	3 cr

B. Actuarial Science and Finance Option

Math Courses (9 cr):

MATH 310	Ordinary Differential Equations	3 cr
MATH 451	Probability Theory	3 cr
MATH 452	Mathematical Statistics	3 cr

400-Level Math Courses (9cr):

MATH*	Additional Math Courses	9 cr

*Three additional courses chosen from Math courses numbered 400 and above. May include STAT 422.

Supporting Courses (12 cr):

ACCT 201	Introduction to Financial Accounting	3 cr
ACCT 202	Introduction to Managerial Accounting	3 cr
FIN 301	Financial Resources Management	3 cr
STAT 431	Statistical Analysis	3 cr

One of the Following (4-6 cr):

ECON 201	Principles of Macroeconomics	3 cr
ECON 202	Principles of Microeconomics	3 cr
OR		
ECON 272	Foundations of Economic Analysis	4 cr

One of the Following (3-4 cr)

CS 112	Computational Thinking and Problem Solving	3 cr
CS 120	Computer Science I	4 cr

One of the following (3 cr)

STAT 251	Statistical Methods	3 cr
STAT 301	Probability and Statistics	3 cr

One of the Following (1-3 cr)

BUS 339	Spreadsheet Modeling	1 cr
STAT 426	SAS Programming	3 cr

At least three courses selected from the following (7-9 cr)

FIN 302	Intermediate Financial Management	3 cr
FIN 381	International Finance	3 cr
FIN 408	Security Analysis	3 cr
FIN 463	Portfolio Management	3 cr
FIN 464	Derivatives and Risk Management	3 cr
FIN 465	Introduction to Market Trading	3 cr
FIN 469	Risk and Insurance	3 cr

ECON 351	Intermediate Macroeconomic Analysis	3 cr
ECON 352	Intermediate Microeconomic Analysis	3 cr
MATH 455	Applied Actuarial Science	1 cr

One of the Following (3 cr):

| STAT 433 | Econometrics | 3 cr |
| STAT 550 | Regression | 3 cr |

Program Resource Requirements.
- Indicate all resources needed including the planned FTE enrollment, projected revenues, and estimated expenditures for the first **four** fiscal years of
- Include reallocation of existing personnel and resources and anticipated or requested new resources.
- Second and third year estimates should be in constant dollars.
- Amounts should reconcile subsequent pages where budget explanations are provided.
- If the program is contract related, explain the fiscal sources and the year-to-year commitment from the contracting agency(ies) or party(ies).
- Provide an explanation of the fiscal impact of any proposed discontinuance to include impacts to faculty (i.e., salary savings, re-assignments).

I. PLANNED STUDENT ENROLLMENT

	FY 19		FY 20		FY 21		FY 22	
	FTE	Headcount	FTE	Headcount	FTE	Headcount	FTE	Headcount
A. New enrollments			2	2	5	5	8	8
B. Shifting enrollments	31	31	31	31	35	40	45	45
Total Enrollment	31	31	33	33	40	45	53	53

II. REVENUE (Scenario B only)

	FY 19		FY 20		FY 21		FY 22	
	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
1. New Appropriated Funding Request	$0.00							
2. Institution Funds								
3. Federal								
4. New Tuition Revenues from Increased Enrollments			$10,692.28		$26,730.70		$42,769.12	
5. Student Fees								
6. Other (i.e., Gifts)								
Total Revenue	$0	$0	$10,692	$0	$26,731	$0	$42,769	$0

Ongoing is defined as ongoing operating budget for the program which will become part of the base.

One-time is defined as one-time funding in a fiscal year and not part of the base.

III. EXPENDITURES

	FY 19		FY 20		FY 21		FY 22	
	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
A. Personnel Costs								
1. FTE	1.0							
2. Faculty	$8,000.00		$8,000.00		$8,000.00		$8,000.00	
3. Adjunct Faculty								
4. Graduate/Undergrad Assistants								
5. Research Personnel								
6. Directors/Administrators								
7. Administrative Support Personnel								
8. Fringe Benefits	$2,072.000 #		$2,072.000		$2,072.000		$2,072.000	
9. Other:								
Total Personnel and Costs	$10,072	$0	$10,072	$0	$10,072	$0	$10,072	$0

	FY 19		FY 20		FY 21		FY 22	
	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
B. Operating Expenditures								
1. Travel								
2. Professional Services								
3. Other Services								
4. Communications								
5. Materials and Supplies	$2,000.00		$2,000.00		$2,000.00		$2,000.00	
6. Rentals								
7. Materials & Goods for Manufacture & Resale								
8. Miscellaneous								
Total Operating Expenditures	$2,000	$0	$2,000	$0	$2,000	$0	$2,000	$0

	FY 19		FY 20		FY 21		FY 22	
	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
C. Capital Outlay								
1. Library Resources								
2. Equipment								
Total Capital Outlay	$0	$0	$0	$0	$0	$0	$0	$0

	FY 19		FY 20		FY 21		FY 22	
D. Capital Facilities Construction or Major Renovation								
E. Other Costs								
Utilites								
Maintenance & Repairs								
Other								
Total Other Costs	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL EXPENDITURES:	$12,072	$0	$12,072	$0	$12,072	$0	$12,072	$0
Net Income (Deficit)	-$12,072	$0	-$1,380	$0	$14,659	$0	$30,697	$0

Budget Notes (specify row and add explanation where needed; e.g., "I.A.,B. FTE is calculated using…"):

I.A	FTE is calculated assuming an increase in enrollment after publicizing the new degree
I.B	FTE is calculated using numbers from the existing options in the BS degree in Mathematics
II.4	Tuition revenue is calculated using data from the UI Budget Office
III.A. 1,2,8	These costs are associated with the Statistics Department funding the Math 455 course formerly funded by the Mathematics Department, and
III.B.5	These costs are associated with funding recruiting events, student events, and undergraduate research