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SUBJECT
Board Policy III.T.—Student Athletes—Second Reading

REFERENCE

August 2012	Board approved second reading of policy III.T. (Formally within III.X.)
April 2016	Board approved first reading of amended policy III.T.

APPLICABLE STATUTES, RULE OR POLICY
Idaho State Board of Education Governing Policies & Procedures, Section III.T.6.

BACKGROUND / DISCUSSION
Acting on the Athletic Committee's recommendation, the Board considered amendments to the "reporting requirement" in Board Policy III.T.6. The proposed amendments to expand the notification requirements to include incidents that are likely to result in legal action in addition to the existing incidences that lead to a conviction and replace the existing ten (10) day reporting requirement to immediate.

IMPACT
The proposed amendments expand the reporting requirements from incidents that led to a conviction to those that are likely to lead to a legal investigation.

ATTACHMENTS
Attachment 1 – Section III.T.6 "Student Athletes"   Page 3

STAFF COMMENTS AND RECOMMENDATIONS
The proposed amendments should (a) improve the responsiveness and timeliness of reports on student athletic conduct issues (those which involve possible or actual legal investigations) to the Board and (b) better reflect the capabilities of current communication modes. There have been one technical change to the proposed amendments since the first reading. Staff recommends approval.

BOARD ACTION
I move to approve the second reading of amendment to Board policy III.T.6, as presented in Attachment 1.

Moved by_____ Seconded by_____ Carried Yes_____ No_____

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Idaho State Board of Education
GOVERNING POLICIES AND PROCEDURES
SECTION: III. POSTSECONDARY AFFAIRS
SUBSECTION: T. Student Athletes   June 2016 August 2012

Student Athlete Conduct

1. Each public college and university shall have a written policy governing the conduct of student athletes. At a minimum, those policies shall include:

    a. A disclosure statement completed and signed by the student athlete prior to participation in any intercollegiate athletic endeavor, which shall include a description of (1) all prior criminal convictions, (2) all prior juvenile dispositions wherein the student was found to have committed an act that would constitute a misdemeanor or felony if committed by an adult, and (3) all pending criminal charges, including juvenile proceedings alleging any act which would constitute a misdemeanor or felony if committed by an adult.

    b. This statement will be kept in the office of the athletic director. Failure to accurately disclose all incidents may result in immediate suspension from the team.

2. Institutions shall not knowingly recruit any person as a player for an intercollegiate athletic team who has been convicted of a felony or, in the case of a juvenile, who has been found to have committed an act which would constitute a felony if committed by an adult. Exemptions to this restriction shall be granted only by the President of the college or university upon recommendation of the athletic director and faculty athletics representative. Such decisions shall be reported in writing to the Executive Director of the State Board of Education at the time the exception is granted.

3. A student athlete convicted of a felony after enrollment, including a plea of nolo contendere on a felony charge, shall be removed from the team and shall not be allowed to participate again in intercollegiate athletics at any Idaho public college or university. Further, an institution may cancel any athletic financial aid received by a student who is convicted of a felony while the student is receiving athletic financial aid subject to NCAA regulations and the institution's applicable student judicial procedure. Nothing herein shall be construed to limit an institution from exercising disciplinary actions or from implementing student athletic policies or rules that go beyond the minimum requirements stated herein.

4. Subject to applicable law, all institutions shall implement a drug education and testing program and shall require all intercollegiate student athletes to give written consent to drug testing as a condition of the privilege of participating in intercollegiate athletics.

5. Institutions shall require their athletic coaches to hold an annual team meeting with their respective teams at the beginning of each season. The coaches shall be required to verbally review the team rules with team members at the meeting. Attendance at this meeting shall be mandatory. Each team member shall receive a written copy of the team rules and sign a statement acknowledging receipt of the rules and attendance at the meeting where the rules were verbally reviewed.

6. Reporting Requirements

   a. Student athletes shall immediately report any ~~criminal charges~~ incident which may result in a legal investigation or criminal charges to their head coach and to the athletic director. Coaches shall be obligated to inform the athletic director of any knowledge of a legal investigation of one or more of ~~charges against~~ their athletes. The athletic director shall report the same to the chief student affairs officer and to the institutional president, who shall report the same ~~in writing~~ to the Executive Director of the State Board of Education as soon as possible~~, but not later than 10 working days~~ after learning of the charges. The report to the Executive Director shall include a description of the alleged violation of law and the institution's proposed action, if any. Verbal reports to the Executive Director shall be followed up with written notification (e.g. email, text, memo, etc.)

   b. Coaches shall immediately report the conviction of any student athlete to the athletic director and the institutional president, who shall report the conviction ~~in writing~~ to the Executive Director of the State Board of Education as soon as possible~~, but not later than 10 working days after the conviction.~~ This report shall include a description of the violation of law and the institution's proposed action, if any. Verbal reports to the Executive Director shall be followed up with written notification (e.g. email, text, memo, etc.).

BOISE STATE UNIVERSITY

SUBJECT
Approval of Master of Science, in Biomolecular Sciences

APPLICABLE STATUTE, RULE, OR POLICY
Idaho State Board of Education Governing Policies & Procedures, Section III.G.

BACKGROUND/DISCUSSION
Boise State University (BSU) proposes to create a new program that will award a Master of Science (MS) degree in Biomolecular Sciences. The proposed program will be offered face-to-face in BSU's regional service area.

Creation of the proposed program will require no additional resources because it will make use of existing courses already being taught in the existing PhD in Biomolecular Sciences program. Among the benefits of the proposed program are the following:

- The program will increase the number of students in courses that presently have capacity, thereby making more efficient use of instructional resources.
- The program will increase the recruitment of students to the PhD program, especially through a 4+1 option for BSU undergraduate students in Physics, Chemistry, and Biology.
- The program will increase the number of qualified students who would be able to go on to PhD programs at University of Idaho (UI) or Idaho State University (ISU).
- The program will provide a mechanism by which students unable to complete their PhD in Biomolecular Sciences (for a variety of possible reasons) are able to receive a degree in return for the coursework they have completed. Such an option is common for PhD programs.

A conservative estimate of need can be derived from the US Department of Labor for a set of relevant fields (with job titles of Biochemists and Biophysicists, Microbiologist, Biological Technician, and Medical scientists (excluding epidemiologists): there are 22 job openings in the fields of Biomolecular Sciences in Boise State's service area, 44 in Idaho, and nationally well over 8,000 openings due to growth and replacement each year. The proposed degree is also excellent preparation for medical, dental, veterinary, and pharmacy school.

UI and ISU offer similar programs in conjunction with their PhD programs in the same fields.

IMPACT
The proposed program will have no fiscal impact, as no new resources are required to create the proposed MS in Biomolecular Sciences. Students in the

MS in Biomolecular Sciences program will be in the same class sections as students in the PhD in Biomolecular Sciences, and in general will make use of underutilized capacity in those sections.

ATTACHMENTS

Attachment 1 – MS, Biomolecular Sciences Program Proposal   Page 5

STAFF COMMENTS AND RECOMMENDATIONS

Boise State University (BSU) proposes the creation of a new academic program that will award a Master of Science degree in Biomolecular Sciences. BSU currently offers a Ph.D. in Biomolecular Sciences which was approved by the Board in November 2011. A progress report for this PhD program is scheduled in September 2018 consistent with Board Policy III.G.8.b.

BSU's request to create a Master of Science in Biomolecular Sciences is consistent with their Service Region Program Responsibilities and is included in their Five-year Plan update to be considered by the Board at the August 2016 meeting. Consistent with Board Policy III.Z, no institution has the statewide program responsibility for a biomolecular sciences program. The following represents other similar programs offered by institutions as provided in the program proposal:

Institution	Degree level	Program Name
BSU	MS	Biology
	MS	Chemistry
ISU	MS	Biology
	MS	Chemistry
	MS	Microbiology
	MS	Physics
UI	MS	Bioinformatics and Computational Biology
		Biology
		Microbiology, Molecular Biology & Biochemistry
		Neuroscience
		Chemistry
		Physics

The proposal went through the program review process and was recommended for approval by the Council on Academic Affairs and Programs (CAAP) on May 26, 2016. The Instruction, Research, and Student Affairs (IRSA) committee also recommended approval at their June 2, 2016 meeting.

Board staff recommends approval.

BOARD ACTION

I move to approve the request by Boise State University to create a new academic program that will award a Master of Science in Biomolecular Sciences in substantial conformation to the proposal submitted in Attachment 1.

Moved by _____ Seconded by _____ Carried Yes _____ No _____

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Idaho State Board of Education
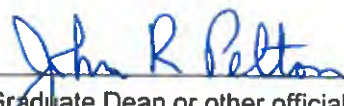
Proposal for **Undergraduate/Graduate Degree** Program
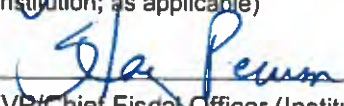
Date of Proposal Submission:	
Institution Submitting Proposal:	Boise State University
Name of College, School, or Division:	College of Arts and Sciences
Name of Department(s) or Area(s):	Biomolecular Sciences program

Program Identification for Proposed New or Modified Program:

Program Title:	Master of Science (MS) in Biomolecular Sciences					
Degree:	MS	Degree Designation		Undergraduate	x	Graduate
Indicate if Online Program:		Yes		x	No	
CIP code (consult IR /Registrar):	26.0210 Biochemistry, Biophysics, and Molecular Biology					
Proposed Starting Date:	Fall 2016					
Geographical Delivery:	Location(s)	Boise		Region(s)	III	
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)	4/11/16 Date	Vice President for Research (Institution; as applicable)	Date
Graduate Dean or other official (Institution; as applicable)	4/11/2016 Date	Academic Affairs Program Manager, OSBE	Date
FVP/Chief Fiscal Officer (Institution)	4/15/16 Date	Chief Academic Officer, OSBE	Date
Provost/VP for Instruction (Institution)	4/14/16 Date	SBOE/Executive Director Approval	Date
President	4/18/16 Date		

Page 1

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. <u>All questions must be answered</u>.

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.

    Boise State University proposes the creation of a new MS in Biomolecular Sciences that will complement the existing PhD in Biomolecular Sciences. Students receiving the MS in Biomolecular Sciences will typically complete a research thesis. A "non-thesis" option will be available for students who do not complete a thesis but instead complete a project, research article, or similar.

    The program will make use of existing courses already being taught in the PhD in Biomolecular Sciences program. Among the benefits of the program are the following:

    - The program will increase the number of students in courses that presently have capacity, thereby making more efficient use of instructional resources.

    - The program will increase the recruitment of students to the PhD program, especially through a 4+1 option for BSU undergraduate students in Physics, Chemistry, and Biology.

    - The program will increase the number of qualified students who would be able to go on to PhD programs at University of Idaho or Idaho State University. Note that students in the proposed MS program will have the opportunity to interact with UI and ISU faculty members at INBRE-sponsored events.

    - The program will provide a mechanism by which students unable to complete their PhD in Biomolecular Sciences (for a variety of possible reasons) are able to receive a degree in return for the coursework they have taken.

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.

    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:

    The following four are used in calculations of job openings:
    1. Biochemists and Biophysicists

2. Microbiologists
3. Biological Technician
4. Medical Scientists, except epidemiologists

Note that the proposed degree is also excellent preparation for medical, dental, veterinary, and pharmacy school, However, numbers are not calculated for the four occupations those schools prepare a student for.

	State DOL data	Federal DOL data	Other data source: (describe)
Local (Service Area)		22	
State		44	
Nation		8740	

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

>Numbers in the table above were calculated from Federal DOL data for the four job titles listed above. It does not include a wide number of other possible occupations (e.g., physician) for which the proposed degree is highly relevant.
>State numbers are 0.5% of federal numbers.
>Service area numbers are 50% of state numbers.

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.**

The program will serve three groups.
- One set of entering students will possess a bachelor's degree in a relevant field (e.g., biology, chemistry, or physics) and will complete a research thesis. These students either will be on a path to enter a PhD program at BSU or elsewhere (e.g., UI or ISU) or will seek employment that requires a master's degree.

- One set of entering students will be in an accelerated 4+1 program. For example, a student in the BS Physics, Biophysics emphasis, will use six graduate credits from the MS Biomolecular Sciences credits toward the completion of the BS Physics (biophysics emphasis) degree.

- One set of entering students will be those who were in the PhD in Biomolecular Sciences but were unable to progress beyond their qualifying exams.

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

The proposed program will provide workers with skills that would fit well into the

biotechnology industry, which is still in its infancy in the Treasure Valley.

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

    e. If Associate's degree, transferability:
   NA

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

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**
BSU	MS MS	Biology Chemistry
ISU	MS MS MS MS	Biology Microbiology Chemistry Physics
UI	MS MS MS MS MS MS	Bioinformatics and Computational Biology Biology Microbiology, Molecular Biology & Biochem Neuroscience Chemistry Physics

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**

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.

It is not feasible for programs at other institutions to serve many of the students who would be served by this program:
- Students in Boise State's Biomolecular PhD program who are not able to complete
- Students who are in BSU's undergraduate Physics, Chemistry, or Biology who want to enter a 4+1 master's program.

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

The highlighted portions of Boise State University's mission statement are especially relevant to the proposed program:

Boise State University is a public, metropolitan research university providing leadership in academics, research, and civic engagement. *The university offers an array of undergraduate degrees and experiences that foster student success, lifelong learning, community engagement, innovation, and creativity. Research, creative activity and graduate programs, including select doctoral degrees, advance new knowledge and benefit the community, the state and the nation. The university is an integral part of its metropolitan environment and is engaged in its economic vitality, policy issues, professional and continuing education programming, and cultural enrichment.*

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.

The following measures will ensure the high quality of the proposed program:

Regional Institutional Accreditation: Boise State University is regionally accredited by the Northwest Commission on Colleges and Universities (NWCCU). Regional accreditation of the university has been continuous since initial accreditation was conferred in 1941. Boise State University is currently accredited at all degree levels (A, B, M, D).

Program Review: Internal program evaluations will take place every five years as part of the normal departmental review process conducted by the Office of the Provost. This process requires a detailed self study (including outcome assessments) and a comprehensive review and site visit by external evaluators. The review process is being considerably strengthened as a result of Program Prioritization with the inclusion of new metrics and a pre-review by the Provost's Office.

Graduate College: The program will adhere to all policies and procedures of the Graduate College, which is a member of the Council of Graduate Schools (Washington, D.C.), the leading authority on graduate education in the United States. The Graduate College has broad institutional oversight of all graduate degree and certificate programs.

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**.

   NA

8. **Teacher Education/Certification Programs** All Educator Preparation programs require review from the Professional Standards Commission (PSC) and approval from the Board. In addition to the proposal form, the Program Approval Matrix (**Appendix C**) is

required for any new and modifications to teacher education/certification programs, including endorsements. The matrix must be submitted with the proposal to OSBE and SDE using the online academic program system as one document.

NA

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

   Yes _____ No x

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

   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?

Although the PhD in Biomolecular Sciences program was too new at the time of Program Prioritization to be evaluated, ongoing assessment processes indicate that the program could make more efficient use of resources and show a greater return on investment as a result of creating the MS in Biomolecular Sciences.

   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?

What would be lost is the opportunity for students to make use of the program beginning in Fall 2016. There is no benefit to delaying the implementation of the program.

   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.	30
Credit hours in required courses offered by other departments:	0
Credit hours in institutional general education curriculum	0
Credit hours in free electives	0
Total credit hours required for degree program:	30

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.

Students in the program typically will complete a research thesis. Those in the "non-thesis" option will complete a research article or similar project.

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.

Program Intended Learning Outcomes: Students	Direct Measures of Achievement of Intended Learning Outcomes	Indirect Measure of Achievement of Intended Learning Outcomes
1. Graduates will be able to formulate relevant research questions	Research activities, classroom activities in core courses (6), evaluation and defense of thesis or projects reports	Exit interview with students, faculty observations and discussions
2. Graduates will be able to conduct independent research using the scientific method	Thesis research or research activities conducted as part of project	Exit interview with students, faculty observations and discussions, presentations at scientific meetings
3. Graduates will be able to effectively communicate scientific findings in both oral and written form to scientific and lay audiences	Classroom activities in core courses (4), evaluation of written thesis or project report, oral defense of thesis or project	Exit interview with students, faculty observations and discussions, presentations at scientific meetings
4.Graduates will gain an educational foundation of the scientific areas of biology, biophysics, and biochemistry and be able to apply and integrate this	Classroom activities and assignments in core courses, formal evaluation of thesis or project	Exit interview with students, faculty observations and discussions

knowledge to advance their research or scholarly activities		
5.Graduates will have achieved a mastery of the discipline	Thesis or project research, publications	Exit interview with students, faculty observations and discussions

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.

1. *Progress and competency in graded coursework* – How students perform in the classroom will provide a direct metric of progress and achievement. Student course evaluations will be collected each semester and used to guide course improvements as needed.
2. *Regular meetings with supervisory committee* – Students will meet on a semester basis with their supervisory committee to discuss research goals and progress.
3. *Formal progress evaluation* – Each semester the major advisor will provide an evaluation of the student's progress with coursework and research. This will include a review of past achievements, future plans, as well as any areas of concern. The advisor and student will meet to discuss the review. A copy of the formal written evaluation will be provided to the program. For students not meeting expectations, the program will ensure that the advisor develops and communicates a written plan and timetable to correct deficiencies.
4. *Thesis or project defense* – The culminating activity is the preparation of a satisfactory written thesis or project, and an oral presentation. Before a defense date can be set, the supervisory committee must ensure that the thesis/project meets professional standards.
5. *3-year post-graduation follow-up interview with* alumni –The program will contact and interview alumni approximately 3 years after graduation to assess whether or not the program was effective in giving the students the practical skills and knowledge necessary to achieve success in the work force.

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

Findings will be reviewed by the program advisory committee and actions recommended.

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

d. **Timing and frequency**. When will assessment activities occur and at what frequency?
On a yearly basis.

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)**			
	FY_13_	FY_14_	FY_15_	FY16__ (most recent)	FY12__	FY_13_	FY_14_	FY_15_ (most recent)
BSU	66	61	47	53	13	13	18	15
ISU	58	50	54	44	24	43	13	17
UI	17	21	19	20	13	9	7	6
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: MS in Biomolecular Sciences											
Projected Fall Term Headcount Enrollment in Program						**Projected Annual Number of Graduates From Program**					
FY_17 (first year)	FY_18	FY_19	FY_20	FY_21	FY_22	FY_17 (first year)	FY_18	FY_19	FY_20	FY_21	FY_22
5	10	10	10	10	10	2	5	5	5	5	5

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 number of MS students is calculated arbitrarily as one-half the number of students enrolled in the PhD in Biomolecular Sciences program in Fall 2015.

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?

The program is without cost therefore there is no minimum enrollment necessary.

Resources Required for Implementation – fiscal impact and budget

17. **Physical Resources.**

   a. **Existing resources**. Describe equipment, space, laboratory instruments, computer(s), or other physical equipment presently available to support the successful implementation of the program.

See Appendix B for a listing of faculty involved in the program as well as equipment available for researchers. Additional detail may be found in the proposal for the PhD in Biomolecular Sciences, approved in November, 2011, for details about resources available for the program.

   b. **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 impact

   c. **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.

No impact

18. **Library resources**

   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.

   No impact

   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.

   No impact

19. **Personnel resources**

   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?

No additional resources will be needed. Students will take courses already being offered.

   b. **Existing resources**. Describe the existing instructional, support, and administrative resources that can be brought to bear to support the successful implementation of the program.

See Appendix B for a listing of faculty involved in the program as well as equipment available for researchers. Additional detail may be found in the proposal for the PhD in Biomolecular Sciences, approved in November, 2011, for details about resources available for the program.

   c. **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?

No impact

   d. **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.

No impact

20. **Revenue Sources**

   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?

No new funds are necessary.

   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.

No new funds are necessary.

   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?

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.

21.   Using the budget template 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).

Note: The creation of this program will require no additional resources. Students will take coursework already being offered.

Program Resource Requirements.

- 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).

I. PLANNED STUDENT ENROLLMENT

	FY 17		FY 18		FY 19		FY 20	
	FTE	Headcou	FTE	Headcount	FTE	Headcou	FTE	Headcount
A. New enrollments	**No change from existing programs**							
B. Shifting enrollments								
Total Enrollment	0	0	0	0	0	0	0	0

II. REVENUE

	FY 16		FY 17		FY 18		FY 19	
	On-	One-time	On-going	One-time	On-going	One-time	On-going	One-time
1. New Appropriated Funding	$0	$0	$0	$0	$0	$0	$0	$0
2. Institution Funds	$0	$0	$0	$0	$0	$0	$0	$0
3. Federal	$0	$0	$0	$0	$0	$0	$0	$0
4. New Tuition Revenues from Increased Enrollments	$0	$0	$0	$0	$0	$0	$0	$0
5. Student Fees	$0	$0	$0	$0	$0	$0	$0	$0
6. Other (i.e., Gifts)	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$0	$0	$0	$0	$0	$0	$0	$0

III. EXPENDITURES

	FY 16		FY 17		FY 18		FY 19	
	On-	One-time	On-going	One-time	On-going	One-time	On-going	One-time
A. Personnel Costs								
1. FTE	$0	$0	$0	$0	$0	$0	$0	$0
2. Faculty	$0	$0	$0	$0	$0	$0	$0	$0
3. Adjunct Faculty	$0	$0	$0	$0	$0	$0	$0	$0
4. Graduate/Undergrad Assista	$0	$0	$0	$0	$0	$0	$0	$0
5. Research Personnel	$0	$0	$0	$0	$0	$0	$0	$0
6. Directors/Administrators	$0	$0	$0	$0	$0	$0	$0	$0
7. Administrative Support Pers	$0	$0	$0	$0	$0	$0	$0	$0
8. Fringe Benefits	$0	$0	$0	$0	$0	$0	$0	$0
9. Other:	$0	$0	$0	$0	$0	$0	$0	$0
Total Personnel and Costs	$0	$0	$0	$0	$0	$0	$0	$0

INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS
JUNE 16, 2016

	FY 16		FY 17		FY 18		FY 19	
	On-	One-time	On-going	One-time	On-going	One-time	On-going	One-time
B. Operating Expenditures								
1. Travel	$0	$0	$0	$0	$0	$0	$0	$0
2. Professional Services	$0	$0	$0	$0	$0	$0	$0	$0
3. Other Services	$0	$0	$0	$0	$0	$0	$0	$0
4. Communications	$0	$0	$0	$0	$0	$0	$0	$0
5. Materials and Supplies	$0	$0	$0	$0	$0	$0	$0	$0
6. Rentals	$0	$0	$0	$0	$0	$0	$0	$0
7. Materials & Goods for Manufacture & Resale	$0	$0	$0	$0	$0	$0	$0	$0
8. Miscellaneous	$0	$0	$0	$0	$0	$0	$0	$0
Total Operating Expenditures	$0	$0	$0	$0	$0	$0	$0	$0

	FY 16		FY 17		FY 18		FY 19	
	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
C. Capital Outlay								
1. Library Resources	$0	$0	$0	$0	$0	$0	$0	$0
2. Equipment	$0	$0	$0	$0	$0	$0	$0	$0
Total Capital Outlay	$0	$0	$0	$0	$0	$0	$0	$0

	FY 16		FY 17		FY 18		FY 19	
D. Capital Facilities Construction or Major Renovation	$0	$0	$0	$0	$0	$0	$0	$0
E. Indirect Costs (overhead)								
Utilites	$0	$0	$0	$0	$0	$0	$0	$0
Maintenance & Rep	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL EXPENDITURES:	$0	$0	$0	$0	$0	$0	$0	$0
Net Income (Defi	$0	$0	$0	$0	$0	$0	$0	$0

Appendix A: Curriculum

Master of Science in Biomolecular Sciences	
Course Number and Title	*Credits*
Core Sequence	
BMOL 601 Biomolecules I	4
BMOL 602 Biomolecules II	4
BMOL 603 Biophysical Instrumentation and Techniques	4
Additional Required Courses	
BMOL 598 Graduate Seminar	2
BMOL 605 Current Scientific Literature	1
BMOL 511 Advanced Cell Biology	3
BMOL 516 Responsible Conduct in Research	1
PHYS 504 Molecular Biophysics	4
BMOL 593 Thesis	7
Non-Thesis Option Students who pursue the non-thesis option will, in lieu of taking BIOL 593, develop a written project proposal and given an oral review and discussion of their project upon completion	
Total	**30**

Appendix B. Resources available:

Faculty Members who Participate in the Biomolecular Sciences Graduate Programs

ALLAN ALBIG, PH.D.
Assistant Professor
Department of Biological Sciences

ERIC BROWN, PH.D.
Associate Professor
Department of Chemistry and Biochemistry

HENRY CHARLIER, PH.D.
Associate Professor
Department of Chemistry and Biochemistry

KEN CORNELL, PH.D.
Associate Professor
Department of Chemistry and Biochemistry

MATTHEW FERGUSON, PH.D.
Assistant Professor
Department of Physics

KEVIN FERIS, PH.D.
Associate Professor
Department of Biological Sciences

DANIEL FOLOGEA, PH.D.
Assistant Professor
Department of Physics

JENNIFER FORBEY, PH.D.
Associate Professor
Department of Biological Sciences

GREG HAMPIKIAN, PH.D.
Professor
Department of Biological Sciences

CHARLES HANNA, PH.D.
Professor
Department of Physics

ERIC HAYDEN PH.D.
Assistant Professor
Department of Biological Sciences

CHERYL JORCYK, PH.D.
Professor
Department of Biological Sciences

BYUNG I. KIM, PH.D.
Professor
Department of Physics

JEUNGHOON LEE, PH.D.
Associate Professor
Department of Chemistry and Biochemistry

OWEN MCDOUGAL, PH.D. -
Professor
Department of Chemistry and Biochemistry

KRISTEN MITCHELL, PHD.
Associate Professor
Department of Biological Sciences

BRAD MORRISON, PH.D.
Assistant Professor
Department of Biological Sciences

RAJESH NAGARAJAN, PH.D.
Assistant Professor
Department of Chemistry & Biochemistry

JULIA OXFORD, PH.D.
Professor
Department of Biological Sciences

ALEX PUNNOOSE, PH.D.
Professor
Department of Physics

JULIETTE TINKER, PH.D.
Associate Professor
Department of Biological Sciences

DON WARNER, PH.D.
Associate Professor
Department of Chemistry and Biochemistry

DENISE WINGETT, PH.D.

Professor
Department of Biological Sciences

Research Instrumentation Used by the Biomolecular Sciences Program

BIOMOLECULAR RESEARCH CENTER
Bruker Daltonics maXis Quadrupole Time-of-Flight (Q-TOF) Mass Spectrometer
Thermo Scientific Velos Pro Dual-Pressure Linear Ion Trap (LIT) Mass Spectrometer
Bruker Daltonics HCTultra PTM Discovery System (ETDII) Ion Trap Mass Spectrometer
Mini-Computer Animated Visualization Environment (mini-CAVE)
SkyScan 1172 MicroCT X-Ray Scanner
Jasco 810 Spectropolarimeter
Wyatt Technologies FFF-MALS
Wyatt Technologies SEC-MALS
Beckman Analytical Ultracentrifuge

CONDENSED MATTER PHYSICS LABS
Physical Electronics Versaprobe XPS system
Philips X'pert MPD diffractometer
Bruker Biospin Elexsys E500 spectrometer
Malvern Zetasizer Nano ZS
Thermal Analysis SDT Q600
Varian Cary 5000 spectrometer
K. J. Lesker Axis RF magnetron sputter deposition system
Quantum Design PPMS and LakeShore 7404 VSM

FLOW CYTOMETRY CORE FACILITY
BD INFLUX Florescent Activated Cell Sorter
Beckman-Coulter EPICS XL flow cytometer
BD FacsCalibur flow cytometer

NUCLEAR MAGNETIC RESONANCE FACILITY
Bruker IPSO 300 MHz NMR with a BBO probe, Bruker AVANCE III 600MHz NMR Spectrometer with liquids (BBO, TXI, and TCI cryoprobe) and solids (4mm MAS) probes

SCANNING PROBE MICROSCOPY LABORATORY
AFM-FET-300x258
AUTOPROBE CP /CPII
AUTOPROBE LS AFM
Digital Instruments Multimode AFM
Cantlever Based Optical Microscope
CLM System with Humidity Controlled Container
Atomic Force Microscope (AFM) and a Field Effect Transistor (FET) (AFM-FET)

MEMBRANE BIOPHYSICS LABORATORY
Axopatch 200B Electrophysiology Amplifier and Digidata 1440A Digitizer, Molecular Devices
Surface Plasmon Resonance – SPRi, Horiba
Fluorescence Spectrometer – Fluoromax4, Horiba
Fluorescence Microscope with TIRF, Olympus
Liposome Extruder, AvantiLipids

BOISE STATE UNIVERSITY

SUBJECT
Approval of new program that will award a Ph.D. in Computing.

APPLICABLE STATUTE, RULE, OR POLICY
Idaho State Board of Education Governing Policies & Procedures, Section III.G.

BACKGROUND/DISCUSSION
Boise State University (BSU) proposes to create a new interdisciplinary program that will award a Ph.D. in Computing. The proposed program will be offered face-to-face in BSU's regional service area.

The discipline of "Computing" is broader than Computer Science, and is defined as any goal-oriented activity requiring, benefiting from, or creating computers. The discipline of computing includes computer science and engineering, computational science and engineering, cyber security, data analytics, data visualization, and information systems.

The program will provide local and regional high-tech industry and agencies with a research and development base and professional advancement opportunities. The economy of southwestern Idaho is home to the largest concentration of high-tech companies in the state. Currently, the rate of production of new doctoral scientists and engineers from Idaho educational institutions is inadequate to meet the demand caused by attrition and employment growth in high-tech companies competing globally.

The proposed program will be highly interdisciplinary, with participation from nine academic departments: Biological Sciences, Biochemistry and Chemistry, Computer Science, Civil Engineering, Electrical and Computer Engineering, Geosciences, Materials Science and Engineering, Mathematics, and Mechanical and Biomedical Engineering.

The proposed program will have three emphases:
- Computer Science, with focus on theory, design, development, and application of computer and software systems, and on the development of algorithms for data search, manipulation, and analysis.
- Computational Science and Engineering, with focus on construction of mathematical models and quantitative analysis techniques and on the use of computers to analyze and solve scientific and engineering problems.
- Cyber Security, with focus on protection of computers, networks, programs, industrial control systems, and data from unintended or unauthorized access, change, or destruction.

A solid foundation for the proposed program has been created by recent growth at Boise State in computing-related disciplines. Jim Nottingham, Hewlett-Packard's Boise Vice President and General Manager, states in his letter of support,

> *"that the continued success and growth of the CS department is vitally important for HP, and for a multitude of other companies in Idaho, and will have significant, transformative economic impact on the Boise Metro area and Idaho."*

Key aspects of the growth of computing-related disciplines are:

- Enrollment in the B.S. in Computer Science program has increased 56% in the last three years to 603 in Fall 2015. Enrollment in the M.S. in Computer Science has increased 86% in the last three years to 56 in Fall 2015.
- In June 2012, the Higher Education Research Council awarded the Department of Computer Science $2.1 million over three years for the computer science program including the addition of four faculty.
- With the goal of doubling the number of computer science graduates by the 2015–16 academic year, the Idaho Department of Labor awarded, in November 2013, the department $1 million over two years to hire three instructors and additional support staff. Local industry provided $280,000 in matching funds used to fund scholarships.
- In March 2015, the Joint Finance-Appropriations Committee approved eight new faculty positions and five graduate assistantships for the Computer Science Department.

Investment in the creation of a PhD in Computing will yield a wide range of substantial benefits. First, the proposed program will train interdisciplinary scientists to use computing theories and engineering principles to contribute to basic research and solve applied problems. Students will be trained in the use of novel integrative approaches that draw strength from both traditional and non-traditional knowledge sets and that enable students to bring to bear unique perspectives on complex computing problems. These students will become the next generation of computing scientists. Through this program, faculty and students will develop new understanding of complex computing systems. The three areas of emphasis of the proposed program (computer science, cyber security, and computational science and engineering) are areas of national priority, and a strong workforce in these areas is needed both locally and nationally. Andrew Slaughter, Computer Scientist at the Idaho National Laboratory noted in his letter of support that,

> *"As a modeling and simulation researcher and software developer at Idaho National Laboratory (INL) I understand that the demand for competent scientists capable of grasping key engineering concepts as well as developing quality software is of critical importance to the continued success of INL."*

Second, the proposed program will provide local and regional high-tech industry and agencies with a research and development base and professional advancement opportunities. The strength and growth of these companies have been heavily dependent on the ability of these companies to recruit science and engineering talent with advanced degrees from outside the state. With the creation of the proposed PhD in Computing, employees of local and regional high-tech companies will have an opportunity to pursue a PhD degree in their field of expertise. In addition, these companies will have a larger local candidate pool to draw from to fill the increasing job openings in the sector. In his letter of support J.R. Tietsort, Chief Information Security Officer and Micron, Inc. states:

> *"Any program that better prepares individuals in the Treasure Valley, and nation to defend against cyber threats will benefit our community and ensure our global competitiveness into the future."*

Third, the new PhD in Computing will enhance the quality of existing undergraduate and graduate programs. Computing-related degree programs are laboratory-intensive, limiting overall capacity to create graduates. The proposed PhD will create opportunities for PhD candidates to assist in the laboratories of those computing courses, enabling expansion of lab section capacity in a much less costly manner. The addition of PhD candidates to the department will also substantially increase the number of opportunities for undergraduate students to participate in research.

Fourth, creation of a PhD program will significantly improve research productivity of faculty members because they will be working with graduate students able to pursue questions that require multiple years of research. As a result, BSU will be able to pursue new funding that targets PhD level training and develops connections with industry.

Fifth, the program will increase opportunities for collaboration with other Idaho institutions. The proposed program will expand the type and number of graduate course offerings in the state, and the use of cross-institutional course delivery will enhance the opportunities for developing scientific collaborations among students and faculty at different institutions. It will also strengthen the ability of BSU's faculty members to collaborate with faculty members in similar programs at the University of Idaho (UI) and Idaho State University (ISU).

ISU offers a PhD in Engineering and Applied Science. Although ISU's program involves various engineering and science departments, it does not focus on computing and therefore has little overlap with BSU's proposed program.

UI offers PhD programs in Computer Science, Mathematics, and Bioinformatics and Computational Biology.
- UI's PhD in Computer Science has a focus that is broadly similar to what is contained in two emphases of the proposed program: the Computer

Science emphasis and the Cyber Security emphasis. The similarity in these programs provides a foundation for collaboration between UI and BSU.

- UI's PhD in Mathematics and PhD in Bioinformatics and Computational Biology have similarity with the Computational Science and Engineering emphasis of the proposed program. However, the Computational Science and Engineering emphasis of BSU's proposed program involves participation from a broad spectrum of academic departments from science and engineering: Biological Sciences, Biochemistry and Chemistry, Computer Science, Civil Engineering, Electrical and Computer Engineering, Geosciences, Materials Science and Engineering, Mathematics, and Mechanical and Biomedical Engineering. In contrast, each of UI's programs has more focus: the faculty members participating in the PhD in Mathematics are predominantly from the Department of Mathematics, and the faculty members participating in the PhD in Bioinformatics and Computational Biology are from biologically-related departments (e.g., Biological Sciences, Fish and Wildlife sciences, and Animal and Veterinary Science) and from the Departments of Mathematics and Statistical Science

Furthermore, BSU's proposed program will fulfill the research and professional development needs of the high-tech industry in the Treasure Valley, and will have major benefits for undergraduate and master's level students in existing BSU programs.

IMPACT

BSU will submit a Line Item Request for the FY18 state budget that will include expenses listed in the FY18 budget of this proposal; full success in that request would result in implementation of the program on the scale and timeline described in this proposal. If not fully funded, the program will be implemented to the extent feasible with existing department resources and reallocated resources. At present BSU has the faculty and most of the graduate assistantships necessary to implement two emphases of the program: Computer Science and Cyber Security.

Among the reasons that it makes sense to submit a Line Item Request to fund the program are the following:

- Previous investment by the state in BSU's computer science programming has created an opportunity to create a new PhD program with the investment of additional resources for graduate assistantships, staff and administrative support, and instructional laboratory facilities, but with minimal investment in new faculty.
- Investment in educational programs in the field of computing is likely to have substantial appeal to state government because of the profound impact such programs have on the economy of the state of Idaho.

ATTACHMENTS
Attachment 1 – Proposal with Appendixes A through D   Page 7

STAFF COMMENTS AND RECOMMENDATIONS
Boise State University plans to seek funding for the program through a Line Item Request to the state legislature in FY18; however, they currently have capacity and resources in terms of faculty and graduate assistantships necessary to implement two of the three emphases of the program. Those include Computer Science and Cyber Security. BSU projects initial enrollment to be at two students to start with 43 by year four, and an average of 45 in any given year once fully operational. It's important to note that the higher projection may only occur if the institution is able to secure the line item request.

The creation of a PhD in Computing at BSU will yield significant dividends. It will build the research and educational training capacity of the state, further establish Idaho's ability to meet state and national workforce demands, contribute to the growth of the state economy, and provide numerous benefits to all of Idaho's institutions of higher education by enhancing opportunities for cross-institutional collaboration. Although there is some overlap with existing programs at UI, staff believes any negatives associated with that overlap are outweighed by the benefits of having a PhD in Computing in close proximity to the expressed need in the Treasure Valley.

BSU's request to create a new Ph.D in Computing is consistent with their Service Region Program Responsibilities and their Five-year Plan for Delivery of Academic Programs in Region III. Consistent with Board Policy III.Z, no institution has the statewide program responsibility for computing, computer science, cyber security, or computational science.

The proposal went through the program review process and was recommended for approval by the Council on Academic Affairs and Programs (CAAP) on May 26, 2016. The Instruction, Research, and Student Affairs (IRSA) committee also recommended approval at their June 2, 2016 meeting.

Board staff recommends approval.

BOARD ACTION
I move to approve the request by Boise State University to create a new academic program that will award a Ph.D. in Computing in substantial conformance to the program proposal submitted as Attachment 1.

Moved by _____ Seconded by _____ Carried Yes _____ No _____

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Idaho State Board of Education
Proposal for **Graduate and Doctoral** Degree Program

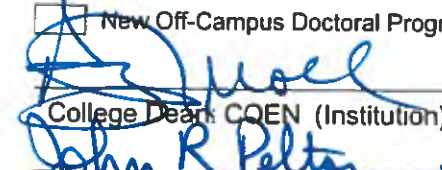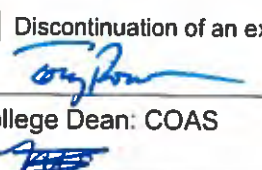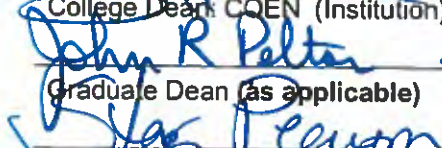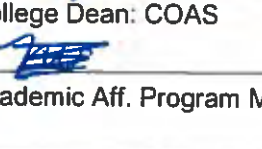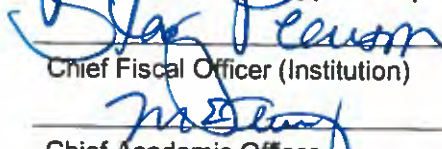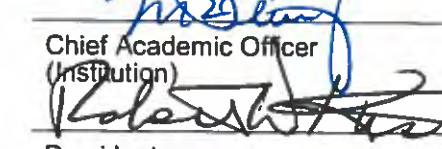|	
Date of Proposal Submission:	
Institution Submitting Proposal:	Boise State University
Name of College, School, or Division:	College of Engineering and College of Arts and Science
Name of Department(s) or Area(s):	Departments of Computer Science and Mathematics (with participation from a variety of other departments in both colleges)
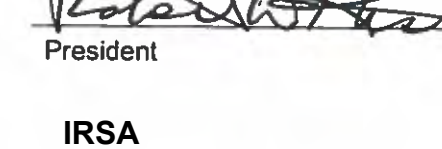
Program Identification for Proposed New, Modified, or Discontinued Program:

Title:	PhD in Computing with emphases in: >Computer Science >Computational Science and Engineering >Cyber Security
Degree:	Doctor of Philosophy
Method of Delivery:	Face-to-Face
CIP code (consult IR /Registrar)	11.0701 Computer Science is the best single CIP Code; however, it does not do justice to the interdisciplinary nature of the proposed program, which includes aspects of 30.3001 Computational Science, 27.0304 Computational and Applied Mathematics, and Cyber Security, which has no designated CIP code
Proposed Starting Date:	Fall 2016
Indicate if the program is:	>**Regional Responsibility**< Statewide Responsibility

Indicate whether this request is either of the following:

[X] New Graduate Program		[ ] Contract Program/Collaborative
[X] New Doctoral Program		[ ] Expansion of an Existing Graduate/Doctoral Program
[ ] New Off-Campus Graduate Program		[ ] Consolidation of an Existing Graduate/Doctoral Program
[ ] New Off-Campus Doctoral Program		[ ] Discontinuation of an existing Graduate/Doctoral Program

College Dean: CQEN (Institution) 3/9/16 Date		College Dean: COAS 3/9/16 Date
Graduate Dean (as applicable) 3-9-2016		Academic Aff. Program Manager Date
Chief Fiscal Officer (Institution) 3-30-2016 Date		Chief Academic Officer, OSBE Date
Chief Academic Officer (Institution) 3/9/16 Date		SBOE/OSBE Approval Date
President 4/8/16 Date		

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

1. **Describe the nature of the request.** Will this program be related or tied to other programs on campus?
Please identify any existing program, option that this program will replace. *If this is request to discontinue an
existing program, provide the rationale for the discontinuance. Indicate the year and semester in which the
last cohort of students was admitted and the final term the college will offer the program. Describe the teach-
out plans for continuing students.*

Boise State proposes the creation of a new interdisciplinary program leading to the degree of **Doctor
of Philosophy in Computing**. The program will have three emphases: Computer Science,
Computational Science & Engineering, and Cyber Security. Faculty members participating in the
program will be drawn from the College of Engineering and the College of Arts and Sciences.

"Computing" is a discipline that is much broader than Computer Science. In ACM Computing Curricula
2005, computing is defined as "any goal-oriented activity requiring, benefiting from, or creating
computers." The discipline of computing includes computer science and engineering, computational
science and engineering, cyber security, data analytics, data visualization, and information systems.

There will be three emphases in the proposed program:

- The Computer Science emphasis will focus on theory, design, development, and application of
  computer and software systems, and the development of algorithms for data search,
  manipulation, and analysis.

- The Computational Science and Engineering emphasis will focus on construction of
  mathematical models and quantitative analysis techniques and use of computers to analyze
  and solve scientific and engineering problems.

- The Cyber Security emphasis will focus on protection of computers, networks, programs,
  industrial control systems, and data from unintended or unauthorized access, change, or
  destruction.

It is anticipated that one or more additional emphases (e.g., Data Analytics) will be added in the future
to reflect areas in which Boise State develops substantial faculty depth.

The proposed program will be built on a solid foundation created by recent growth at Boise State in
computing-related disciplines.

- Enrollment in the B.S. in Computer Science program has increased 56% in three years, from
  385 in Fall 2012 to 603 in Fall 2015, and the enrollment of the M.S. in Computer Science has
  increased 86% in three years, from 30 in Fall 2012 to 56 in Fall 2015.

- In June 2012, the Higher Education Research Council, an advisory group within the Idaho
  State Board of Education, awarded the Department of Computer Science $2.1 million over
  three years to hire four faculty members.

- In November 2013, the Idaho Department of Labor awarded the department $1 million over
  two years to hire three instructors and additional support staff. Local industry provided
  $280,000 in matching funds that has been used to fund over 60 scholarships for juniors and
  seniors. A main goal of the above funds was to double the number of computer science
  graduates by the 2015–16 academic year.

- In March 2015, the Joint Finance-Appropriations Committee in the State Legislature approved
  eight new faculty positions and five graduate assistantships for the Computer Science
  Department. This is expected to increase the total number of graduates from about 60 to
  about 100 per year.

The above funding resources have offered an unparalleled opportunity for expanding Boise State's Computer Science program to become one of the premier programs in the northwest for both teaching and research. The expansion of the program has not gone unnoticed by top industry firms, such as Hewlett-Packard. Jim Nottingham, Hewlett-Packard's Boise Vice President and General Manager, states in his attached letter of support,

> *"that the continued success and growth of the CS department is vitally important for HP, and for a multitude of other companies in Idaho, and will have significant, transformative economic impact on the Boise Metro area and Idaho."*

It is the intent of Boise State University to seek the additional resources needed to create the proposed new PhD program in Computing via a FY2018 Line Item Request to the Idaho State Legislature. There are a number of reasons why this funding source makes sense; among them are:

- The investment of by the state (as described in preceding paragraphs) has created an opportunity to create a new PhD program in Computing with the investment of additional resources for graduate assistantships, staff and administrative support, and instructional laboratory facilities.

- As evidenced above by our past success, investment in educational programs in the field of Computing is one that has great appeal to state government because of the profound impact such programs have on the economy of the state of Idaho.

2. **List the objectives of the program.** The objectives should address specific needs the program will meet. They should also identify and the expected student learning outcomes and achievements. *This question is not applicable to requests for discontinuance.*

Boise State University has four broad objectives in the creation of this new PhD program: (i) increase Boise State's capacity for solving complex interdisciplinary computing problems in the areas of computer science, computational science and engineering, and cyber security; (ii) provide the local and regional high-tech industry and agencies with a research and development base and opportunities for professional advancement for personnel; (iii) enhance quality of existing undergraduate and graduate programs, and increase faculty research productivity; and (iv) increase opportunities for collaboration with other Idaho institutions.

i. **Increase Boise State's capacity for solving complex interdisciplinary computing problems**

Solving complex problems often requires multiple perspectives and multiple areas of expertise. The proposed program is highly interdisciplinary, bringing together faculty members from the Departments of Computer Science, Mathematics, Biological Sciences, Chemistry and Biochemistry, Civil Engineering, Geosciences, Materials Science and Engineering, and Mechanical and Biomedical Engineering. The proposed program will train interdisciplinary scientists to use computing theories and engineering principles to contribute to basic research and solve applied problems. By training students in the use of novel integrative approaches that draw strength from both traditional and non-traditional knowledge sets and that enable students to bring to bear unique perspectives on complex computing problems, students from this program will become the next generation of computing scientists. Through this program our faculty and students will develop new understanding of complex computing systems.

The three areas of emphasis of the proposed program (computer science, cyber security, and computational science and engineering) are areas of national priority, and a strong workforce in those areas is needed locally and nationally. The report from the President's Information Technology Advisory Committee (PITAC) in 2005 entitled "Computational Science: Ensuring America's Competitiveness" states that computational science is indispensable to the solution of complex

problems in every sector, from traditional science and engineering domains to such key areas as national security, public health, and economic innovation. According to (ISC)[2] 2013 Global Information Security Workforce Study, cyber security jobs have grown 74% from 2007-2013. In 2013, there were 209,749 postings for cyber security-related jobs nationally. An August 2014 article in Forbes magazine predicts that cyber security spending will approach $640 billion by 2023, a tenfold increase. Locally, Idaho National Laboratory has requested Boise State to produce 7-10 graduates per year with skills in cyber security of industrial control systems. The Computer Science Industry Advisory Board has asked that Boise State focus on developing expertise and producing students in the cyber security arena. Brad Richy, the Chief of the Idaho Bureau of Homeland Security notes in his letter of support that,

> *"There is a serious and immediate need for highly educated and experienced cyber security professionals."* and hopes *"...that a rigorous and in depth cyber security curriculum will train a new generation of specialists to deal with the increasingly complex and dynamically changing cyber security problems and issues."*

Andrew Slaughter, Computer Scientist at the Idaho National Laboratory noted in his letter of support that,

> *"As a modeling and simulation researcher and software developer at Idaho National Laboratory (INL) I understand that the demand for competent scientists capable of grasping key engineering concepts as well as developing quality software is of critical importance to the continued success of INL."*

Rich Stuppy, Chief Operating Officer of Kount, Inc., states in his letter of support that,

> *"My company, Kount, protects companies from fraud, risk, and loss in the online world. As such, we see a tremendous need for new and innovative solutions in the field of cyber security on a daily basis."*

Sean Vincent, Hydrology Section Manager at the Idaho Department of Water Resources, states in his letter of support that,

> *"the program will produce readily employable PhD Graduates that will contribute to the development and improvement of computational models that are increasingly relied upon by industry and government to help solve real-world problems, such as those faced by water managers here in Idaho."*

ii.   **Provide the local and regional high-tech industry and agencies with a research and development base and professional advancement opportunities.**

The proposed PhD program in Computing will give students, local and regional industry, and state and federal agencies in southwest Idaho access to a research-intensive program with strengths in computer science, computational science and engineering, and cyber security. The economy of southwest Idaho includes the largest concentration of high-tech companies in the state. The critical elements identified by the Governor's Science and Technology Advisory Council to support the growth of this knowledge-based economy include a research and development base, a highly skilled technical workforce, entrepreneurial culture, knowledge-transfer mechanism, and technology infrastructure. It is evident that the production rate of new doctoral scientists and engineers from Idaho educational institutions is inadequate to meet the demand for attrition and employment growth for high-tech companies competing globally. The growth of high-tech companies has been heavily dependent on the ability of these companies to recruit science and engineering talent with advanced degrees from outside of the state. The proposed PhD program will enable us to recruit higher quality students from Idaho and beyond and generate a significant number of graduate students with advanced skills. Thus, the program will help satisfy the needs of the high-tech companies in the region and contribute to the local economy in a more significant way. In an attached letter of support, former Boise State Civil

Engineering Master's student Vahab Bolvardi sums up the appeal of the program well:

> *"Offering such a unique Ph.D. program in this extremely interdisciplinary area at Boise State University would be attractive and provide better opportunities for students who graduate from various science and engineering Masters programs from other schools looking for a Ph.D. position like myself." "Not only is this chance helpful for those students but it may also encourage students in other disciplines to pursue their Ph.D. in such an area, which provides essential knowledge applicable across various majors."*

J.R. Tietsort, Chief Information Security Officer at Micron, Inc., stated in his letter of support that, *"Any program that better prepares individuals in the Treasure Valley, and the nation, to defend against cyber threats will benefit our community and ensure our global competitiveness into the future."*

Not only is there demand for skilled future employees in the state, agencies such as Idaho National Laboratory (INL) have a need for enhanced computational skills of its own employees and a connection with such a program. Brent Stacey, Associate Laboratory Director at Idaho National Laboratory asserts in his letter of support that:

> *"INL will support BSU in order to provide online and hybrid course offerings that would accommodate participation by our personnel, advertise and encourage INL employees to take the classes in future years, consider BSU students for intern and postdoctoral assignments, and work on joint research projects."*

iii.   **Enhance quality of existing undergraduate and graduate programs, and increase faculty research productivity**

The proposed PhD program will enhance the productivity, quality, and efficiency of existing undergraduate and graduate programs in several ways. First, computing-related degree programs are laboratory-intensive, limiting overall capacity to create graduates and slowing the completion of those who do progress to graduation. The proposed PhD program will create opportunities for PhD candidates to assist in the laboratories of those computing courses, enabling expansion of lab section capacity in a much less costly manner than the addition of tenure-track faculty members.

Second, the proposed PhD program will substantially increase the number of opportunities for undergraduate students to participate in research. The presence of advanced graduate students and their dissertation research creates an environment that fosters student-to-student mentoring and creates more opportunities for hands-on participation in advanced, applied research. A PhD program will also allow us to increase our use of Vertically Integrated Projects (VIPs), a concept pioneered at Georgia Tech (http://vip.gatech.edu/new/) and Purdue (https://engineering.purdue.edu/vip/) that is designed to promote balanced student growth through the undergraduate years, provide structure and flexibility for students and develop a strong sense of comradery that increases retention and satisfaction. The VIP structure encourages interaction between all levels of education and experience, with more senior members tutoring and working with novices, and the opportunity for new researchers to get more involved as they gain skills. The interplay between all levels in a laboratory increases productivity and develops communication skills.

Third, at the graduate-program level, a common concern of students is that there is not enough diversity of coursework. The creation of a new interdisciplinary PhD program will provide master's-level science and engineering students with a substantial expansion in the diversity of available graduate-level coursework.

Additionally, creation of a PhD program will significantly improve research productivity of faculty members because they will be working with graduate students able to pursue questions that require multiple years of research. Subsequently, Boise State will be able to pursue new funding opportunities that (i) target PhD level training, such as, NSF's Integrative Graduate Education and

Research Traineeship Program, NSF's Alliances for Graduate Education and the Professoriate, Department of Energy's Science Graduate Student Research Program, Department of Education's Graduate Assistance in Areas of National Need program and (ii) develop connections between academic institutions and industry, such as, NSF's Grant Opportunities for Academic Liaison with Industry Program and NSF's Science, Technology, and Society Program.

The following list is a sample of collaborative projects among faculty members in the departments that will participate in the program. The list illustrates the academic foundation for the program and the strength of already-existing interdisciplinary collaboration. Importantly, the set of collaborative research programs will grow substantially following the creation of the new PhD in Computing.

- NSF-funded project "SI2-SSE: GEM3D: Open-Source Cartesian Adaptive Complex Terrain Atmospheric Flow Solver for GPU Clusters," by Inanc Senocak (Mechanical & Biomedical Engineering), Elena Sherman (Computer Science), Grady Wright (Mathematics), Donna Calhoun (Mathematics). This project is developing open-source software using latest computational advances in hardware and methodology to help predict wind patterns, determine optimal placement of wind turbines and increase capacity on existing transmission lines.

- NSF-funded project "Collaborative Research: Computational techniques for nonlinear joint inversion," by Jodi Mead (Mathematics) and John Bradford (Geophysics). This project aims at practical solutions of inverse problems obtained by including physically-motivated stabilizing constraints.

- NSF-funded project "ATD: Data-driven stochastic source inversion algorithms for event reconstruction of biothreat agent dispersion," by Jodi Mead (Mathematics) and Inanc Senocak (Mechanical & Biomedical Engineering). This project is developing computationally fast mathematical algorithms to reconstruct the dispersion of a chemical or biological agent that is detected by a sensor network.

- NSF funded Project "EPSCOR MILES," by Nancy Glenn (Geosciences), Lejo Flores (Geosciences), Shawn Benner (Geosciences), and Vijay Dialani (Computer Science). This project aims to replace surveys with social media data and enable parallel version of ENVISION toolkit.

- NSF-funded project "MRI: Acquisition of a GPU-accelerated high performance computing and visualization cluster," by Inanc Senocak (Mechanical & Biomedical Engineering), Julia Oxford (Biological Sciences), Timothy Andersen (Computer Science), Peter Mullner (Materials Science and Engineering, and HP Marshal (Geosciences). This instrument will support research in multi-scale wind energy forecasting, data-driven modeling for threat reduction in chemical and biological defense, material characterization and modeling, snow hydrology and remote sensing, and fundamental studies on understanding the mechanisms in skeleton development in living systems and how living systems maintain complex three dimensional shapes.

- NSF project "HAZSEES" submitted by Eric Lindquist (Public Policy & Administration), Vijay Dialani (Computer Science), Nancy Glenn (Geosciences), Thomas Wuerzer (Community and Regional Planning) and Jen Pierce (Geosciences). This project aims at modeling life cycle of forest fires and providing decision support tools to manage fire incidences.

- NSF project "Complex Pattern Modeling," by Tim Andersen (Computer Science) and Jeff Habig (Simplot). This project aims to advance the understanding of shape controls by complex systems by creating an Artificial Intelligence tool to identify mechanistic explaining of the remarkable regenerative abilities of planarian worms.

- NSF proposal "Dockomatic: high throughput virtual screening tool," submitted by Owen McDougal (Chemistry) and Tim Andersen (Computer Science). This project proposes to create an open-source, integrated, easy-to-use tool for molecular modeling and high throughput

virtual screening.

- NSF proposal "CICI: Secure Data Architecture: A Secure Architecture for SDN-Based HPC," submitted by Dianxiang Xu (Computer Science), Izzat Alsmadi (Computer Science), Yang Lu (Civil Engineering), and Nan Li (Materials Science and Engineering). This project proposes to develop a secure architecture for software-defined network based high-performance computing.

- Idaho HERC Project "High Dielectric Constant Materials at the Nanometer Scale for Microelectronic Devices," by Amit Jain (Computer Science) and Bill Knowlton (Materials Science & Engineering). This project developed algorithms and implemented Band Diagram program in Java that is used by industry and academia in over fifty countries now.

- Boise State Project "Community Involved NEtworked Agent-based VIsualization System: A Means to an End for the Wicked Problems in Regional Planning?" by Amit Jain (Computer Science) and Susan Mason (Community and Regional Planning). This project is developing tools to help with large urban planning problems where cooperation from multiple stakeholders is required.

- NSF proposal "CRISP Type I: Stochastic Multiscale Modeling for Interdependent Infrastructure Systems: Dams, Transportation and Governance Networks," submitted by Yang Lu (Civil Engineering), Dianxiang Xu (Computer Science), Leming Qu (Mathematics), and Eric Lindquist (Public Policy & Administration). This project aims to use stochastic multiscale and vulnerability analyses to understand how the interaction of extreme events disrupts dam and transportation networks, and how both these networks influence the governance network making infrastructure planning decisions.

- NSF proposal "CPS: Synergy: Moving Towards an Autonomous Signal Timing System: A Cyber-Physical Systems Approach," submitted by Mandar Khanal (Civil Engineering) and Dianxiang Xu (Computer Science). This project will improve flows on road networks in urban areas using an autonomously designed signal timing that is based on predicted turning movements.

- Collaborative project with Army Research Lab "Trust-based access control in online social networks," by Dianxiang Xu (Computer Science), Izzat Alsmadi (Computer Science), Hao Chen (Electrical and Computer Engineering), and Jin-Hee Cho (Army Research Lab). This project aims to promote information sharing with strong protection of information security and privacy in social networks.

iv.   **Increase opportunities for collaboration with other Idaho institutions.**

The proposed program will strengthen the ability of Boise State University's faculty members to collaborate with faculty members in similar programs at the University of Idaho and Idaho State University, and to leverage opportunities for student training. The proposed program will expand the type and number of graduate course offerings in the state, and the use of cross-institutional course delivery will enhance the opportunities for developing scientific collaborations among students and faculty at different institutions.

The proposed program will also enhance collaborative research endeavors. There are numerous examples of successful (i.e. extramurally funded) inter-institutional collaborations among faculty at BSU, ISU, and UI. These include collaborations stimulated by past and on-going EPSCoR awards, cross-institutional research projects supported by the Center for Advanced Energy Studies, and collaborative research projects funded by NSF. Lyudmyla L. Barannyk, Assistant Professor of Mathematics at the University of Idaho noted in her letter of support that,

> *"This program will … increase opportunities for Boise State University faculty to collaborate with faculty from other Idaho institutions including the University of Idaho. In fact, you and I already had some opportunities to visit each other several times and work together on inverse methods and*

regularization."

Somantika Datta, Assistant Professor of Mathematics at the University of Idaho, notes that,

> *"...my research involves developing and studying mathematical techniques that can be applied to signal and image processing. Since one of the goals of the proposed program is to increase the capacity for solving complex interdisciplinary computing problems in the areas of computational science and engineering, if a student's project were to suitably align with my own, I would be highly interested in participating either as a member of a course supervisory committee or in some other form."*

Program Intended Learning Outcomes and Assessment Plan:

Program Intended Learning Outcomes: *Graduates of this program are expected to have the following skills and knowledge:*	**Direct measures of Achievement of Intended Learning Outcomes**	**Indirect Measure of Achievement of Intended Learning Outcomes**
1. Graduates will be able to pose relevant research questions and will be able to conduct independent research using the scientific method to address those questions.	Proposal and comprehensive exam, dissertation research and defense	Exit interview with students, faculty observations and discussions
2. Graduates will be able to effectively communicate the results of scientific research in both written and oral form to scientific and public audiences.	Required proposal and oral presentation, dissertation and defense, publications	Exit interview with students, faculty observations and discussions, presentations at professional meetings, publications
3. Graduates will be able to devise, analyze, and evaluate new methods for solving complex computing problems.	Assignments in coursework, dissertation research and defense	Exit interview with students, faculty observations and discussions
4. Graduates will be able to select and apply computing techniques and tools to build reliable, and maintainable software.	Assignments in coursework, completion of dissertation research and defense	Exit interview with students, faculty observations and discussions
5. Graduates will be able to select and apply computational algorithms and techniques in the analysis and solution of complex questions across a variety scientific domains.	Assignments in coursework, completion of dissertation research and defense	Exit interview with students, faculty observations and discussions
6. Graduates will have achieved a level expertise in their discipline.	Dissertation research and defense, publications	Exit interview with students, faculty observations and discussions, publications

3. **Briefly describe how the institution will ensure the quality of the program** (i.e., program review). Will the program require specialized accreditation (it is not necessary to address regional accreditation)? If so, please identify the agency and explain why you do or do not plan to seek accreditation. *This question is not applicable to requests for discontinuance.*

The following measures will ensure the high quality of the proposed program:

Regional Institutional Accreditation: Boise State University is regionally accredited by the Northwest Commission on Colleges and Universities (NWCCU). Regional accreditation of the university has been continuous since initial accreditation was conferred in 1941. Boise State University is currently accredited at all degree levels (A, B, M, D).

Specialized Accreditation: The Boise State University undergraduate engineering programs (e.g., civil engineering, computer science, electrical and computer engineering, materials science and engineering, and mechanical engineering) have been accredited by ABET, Inc. Engineering disciplines are normally only accredited by ABET at one level, the undergraduate level. The Computer Science program underwent a successful reaccreditation visit in Fall 2012, and was reaccredited to 2018 as a result of the visit.

Program Review: Internal program evaluations will take place every five years as part of the normal departmental review process conducted by the Office of the Provost. This process requires a detailed self study (including outcome assessments) and a comprehensive review and site visit by external evaluators. The review process is being considerably strengthened as a result of Program Prioritization with the inclusion of new metrics and a pre-review by the Provost's Office.

Graduate College: The program will adhere to all policies and procedures of the Graduate College, which is a member of the Council of Graduate Schools (Washington, D.C.), the leading authority on graduate education in the United States. The Graduate College has broad institutional oversight of all graduate degree and certificate programs.

Program Oversight: The proposed new PhD in Computing will build on a significant foundation of experience within the Computer Science department of managing the MS in Computer Science program successfully. The graduate student community of the department currently includes approximately 50 MS students. The governance structure, policies and procedures of the PhD program will ensure that students receive the individual mentoring, guidance, and professional development needed to progress through their programs in a timely manner.

Student Mentoring and Program Assessment: On-going program evaluation and assessment at the program level will provide essential information to help ensure the long-term quality of the program. Assessment activities will allow monitoring of individual student progress in the program so challenges can be recognized early and managed effectively. Integrated and evaluated over time, this feedback can also be used to fine-tune and adjust the overall program design, as needed to maintain excellence. Components of the student mentoring and outcomes assessment plan include:

- *Appointment of a Major Advisor who has the primary responsibility for day-to-day mentoring and professional development of their students* – Identification of the advisor will be strongly encouraged for admission to the program.

- *Planning of academic course work* – Students will work with their advisor and committee to complete a Program Development Form (PDF), which identifies the calendar of course work necessary for students to complete their degree requirements. Each student's PDF is up-dated on an annual basis, providing an opportunity for the advisor and student to review the plan and make corrections, additions, etc., as necessary. Completed PDFs are placed in each student's departmental file.

- *Progress and competency in graded coursework* – How students perform in the classroom will provide a direct metric of progress and achievement – particularly in the early portion of the program when much of the required course work is typically taken by students.

- *Comprehensive examination* - As discussed below (#6), the comprehensive exam represents a significant milestone and an important assessment tool for monitoring how well students have

assimilated information from various sources and integrated it into a comprehensive knowledge of the focus area. It will have both an oral and written component.

- *Dissertation proposal* – As discussed below (#6), the dissertation proposal and oral defense assess the suitability of a PhD student for research in a specific area and will focus on advanced coursework and research in the student's dissertation area. Satisfactory completion is required for the student to become a PhD candidate.

- *Dissertation defense* – The culminating activity of the program is the oral presentation and public defense of the dissertation (discussed in more detail below).

- *Program assessment* – The program will undergo an annual assessment that includes exit interviews of graduating students, compilation of student publications, bibliometrics, awards, and special activities (such as internships, workshops, and extended visits to other institutions), monitoring of initial post-graduate employment and ongoing career development, and key metrics of the student pipeline including data for admission, enrollment, degree progress, overall time-to-degree, student financial support, and attrition (including analysis of reasons for attrition). This assessment is the responsibility of the program director assisted by Institutional Research and the Graduate College, and results in a report to the deans of the participating colleges. The report must include a description of previous actions used to improve the program, the results of those actions, and any newly recommended or modified actions to be undertaken by the program in response to the most recent assessment. The deans are responsible for discussing the report with the provost and for administrative actions necessary for implementation of the improvement plan by the program.

Faculty Steering Committee: The Faculty Steering Committee is responsible for curriculum changes, academic policies, student recruitment and admission recommendations, management of program graduate assistants, appointment of supervisory committees, monitoring of student progress, resolution of ad hoc student issues, and other responsibilities defined in the graduate handbook for the program.

Supervisory Committee: The Supervisory Committee is charged with general guidance of the doctoral student, including design and approval of the program of study, participation in the comprehensive examination, supervision of the dissertation research, and participation in the dissertation defense. The Supervisory Committee consists of a major advisor who acts as chair, and at least three additional members, two of whom must be participating faculty in the PhD program, including one from the same emphasis. All committee members must be the University regular or research faculty and must also be members of the Graduate Faculty. At least one faculty member is from computer science, and in the case of the CSE emphasis there must also be at least one member from mathematics and a science or engineering discipline. Additional members may be appointed when such appointments enhance the function of the Committee. The committee members are selected by the student and the major advisor and approved by the program director. A change of the major advisor or supervisory committee member can be made after initial appointment. The Appointment of Supervisory Committee form should be submitted to and approved by the program director and the graduate college.

Application and Admission Requirements: Applicants to the PhD program in Computing will be required to have a Bachelor's or Master's degree in computer science, mathematics, science, engineering, or a related discipline from an accredited college or university. Admission will be competitive and will be based on previous experience in the field, transcripts, professional references, scores on the general test of the Graduate Record Examination (GRE), and evaluation of a letter of intent describing previous research experience and the applicant's professional interests and plans for the future.

Milestones and Timeline: The milestones of the PhD study include appointment of a major

advisor and supervisory committee, formulation of plan of study, completion of course work, completion of the comprehensive examination, dissertation proposal defense, and final dissertation defense. The major advisor is appointed when the student is admitted to the program. An Appointment of Supervisory Committee form should be submitted within the first semester. A student must take the comprehensive examination no later than having completed 36 credits of course work in the program. Once the student has passed the comprehensive examination, the student is eligible to defend their dissertation proposal. The dissertation proposal should be defended within one year after the completion of the comprehensive examination and two semesters before the final dissertation defense. After successful proposal defense, the student is recommended for Advancement to Candidacy.

Appeal Process: Students have the right to file a written appeal regarding the decisions on their comprehensive examination, dissertation proposal defense, and final dissertation defense. The faculty steering committee serves as an appeal mechanism for decisions made by student's supervisory committee. The program director offers an appeal mechanism for decisions and recommendations of the faculty steering committee. The Boise State University Graduate Council and Graduate Dean serves an appeal mechanism for decisions made by the program director.

Master's Degree Option: A doctoral student who has failed the comprehensive exam, the proposal/dissertation defense, or under special circumstances, may petition to the program for approval to transfer to a related Master's program.

4. **List new courses that will be added to your curriculum specific for this program.** Indicate number, title, and credit hour value for each course. Please include course descriptions for new and/or changes to courses. *This question is not applicable to requests for discontinuance.*

1) **CS 507 COMPUTING FOUNDATIONS FOR COMPUTATIONAL SCIENCE (3-0-3)(S).** A review of object-oriented design including inheritance, polymorphism, and dynamic binding as applied to scientific computing problem. Sorting and searching. Introduction to data structures: lists, collections, stacks, trees, balanced search trees, B-Trees, heaps, hash tables, graphs, queues and dictionaries. PREREQ: Admission to PhD in Computing with CSE emphasis.

2) **CS/MATH 565 NUMERICAL METHODS I (3-0-3)(F).** Approximation of functions, solutions of equations in one variable and of linear systems. Polynomial, cubic spline, and trigonometric interpolation. Optimization. Programming assignments. PREREQ: (MATH 365 or PERM/INST) and (MATH 301 or MATH 333).

3) **CS/MATH 566 NUMERICAL METHODS II (3-0-3)(S)**. Matrix theory and computations including eigenvalue problems, least squares, QR, SVD, and iterative methods. Discrete Fourier transform and nonlinear systems of equations. Programming assignments. PREREQ: MATH 465/565 or PERM/INST.

4) **CS 621 DIGITAL FORENSICS (3-0-3)(F)**. Explores principles and practices of digital forensics, including identification, collection, acquisition, authentication, preservation, examination, analysis, and presentation of digital evidence. Discusses computer forensics, network forensics, cell phone forensics, and other types of digital forensics. PREREQ: Regular admission to Doctor of Philosophy in Computing or Master of Science in Computer Science.

5) **CS 622 ADVANCED NETWORK SECURITY (3-0-3)(F).** Explores security aspects of emergent network environments, including multiparty, cellular, sensor, VoIP, smart grid, and SDN environments. Focuses on intrusion detection, intrusion prevention, traffic analysis, and responses to network attacks. PREREQ: CS 525, CS 546, and regular admission to Doctor of Philosophy in Computing or Master of Science in Computer Science.

6) **CS 623 CYBER PHYSICAL SYSTEMS (3-0-3)(F)**. Studies principles, methods, and techniques for designing and analyzing cyber-physical systems. Topics will include system design, monitoring, real-time scheduling, feedback control, hazard analysis, verification and validation, and emerging applications of cyber physical systems. PREREQ: Regular admission to Doctor of Philosophy in Computing or Master of Science in Computer Science.

7) **CS 624 CYBER SECURITY OF CRITICAL INFRASTRUCTURES (3-0-3)(S).** Explores vulnerabilities, threats, and mitigating controls of critical infrastructures. Examines national policies, frameworks, industry standards, and sector-wide initiatives for protection of critical infrastructures. Discusses environmental, operational, and economic impacts of attacks and supporting mitigating controls. PREREQ: Regular admission to Doctor of Philosophy in Computing or Master of Science in Computer Science.

8) **MATH 567 NUMERICAL METHODS FOR DIFFERENTIAL EQUATIONS (3-0-3)(F)**. Numerical techniques for initial and boundary value problems. Elliptic, parabolic, hyperbolic, and functional differential equations. Finite difference, finite volume, finite element, and spectral methods. Efficiency, accuracy, stability and convergence of algorithms. Programming assignments. PREREQ: MATH 333 and MATH 465/565 or PERM/INST.

9) **MATH 572 COMPUTATIONAL STATISTICS (3-0-3)(F).** Introduction to the trend in modern statistics of basic methodology supported by state-of-art computational and graphical facilities, with attention to statistical theories and complex real world problems. Includes: data visualization, data partitioning and resampling, data fitting, random number generation, stochastic simulation, Markov chain Monte Carlo, the EM algorithm, simulated annealing, model building and evaluation. A statistical computing environment will be used for students to gain hands-on experience of practical programming techniques. PREREQ: MATH 361.

5. **Please provide the program completion requirements to include the following and attach a typical curriculum to this proposal as Appendix A.** *For discontinuation requests, will courses continue to be taught?*

Credit hours required:	67
Credit hours required in support courses:	18
Credit hours in required electives:	18-24
Credit hours for thesis or dissertation:	24-30
Total credit hours required for completion:	67

6. **Describe additional requirements such as preliminary qualifying examination, comprehensive examination, thesis, dissertation, practicum or internship, some of which may carry credit hours included in the list above.** *This question is not applicable to requests for discontinuance.*

Comprehensive Examination: The objective of the comprehensive examination is to judge depth and breadth of knowledge. The student must enroll in CS 691 Doctoral Comprehensive Examination for the semester during which they plan to take the comprehensive examination. The comprehensive examination includes a written portion and an optional oral portion. The need for the oral portion is determined by the supervisory committee. The written portion consists of written responses to a series of questions from three topical areas approved by the supervisory committee. The student must submit the selected topic areas to the program director for approval within the first four weeks of the semester. The questions are designed and graded by the instructors who taught the topic courses in the most recent years. The instructors in consultation with the faculty steering committee will determine if the student passes or fails. If a student fails the initial written examination, the student is allowed to retake the parts of the examination they did not pass one time. This must be done the next time the examination is offered. The oral portion of the examination, if required by the supervisory

committee, should be conducted within the same semester as the written portion. In this case, the student needs to pass both the written and oral portions. During the oral exam students are expected to demonstrate solid, in–depth, academic knowledge related to the focus area. The decision of whether a student passes or fails the oral exam rests with the supervisory committee members. If a student fails the initial oral exam, the supervisory committee has the option of allowing a student to repeat the oral exam one time. If a repeat oral exam is granted by the supervisory committee, it must occur within the next semester (not including summer) of the initial oral examination. Failure of the comprehensive examination will result in dismissal from the PhD program.

Dissertation Proposal: The objective of the dissertation proposal and oral defense is to assess the suitability of a PhD student for research in a specific area and will focus on advanced coursework and research in the student's dissertation area. Satisfactory completion is required for the student to become a PhD candidate. The dissertation proposal should be presented within one year of satisfactory completion of the comprehensive examination and must be approved by the supervisory committee one year before the final dissertation defense. The student must submit a written dissertation proposal to the Supervisory Committee two weeks before the oral proposal defense. The proposal should describe in sufficient detail the proposed scope of work, anticipated scientific impact, timeline, and a plan for obtaining and utilizing the resources necessary to complete the research. After the Supervisory Committee reviews the proposal they can give their approval to proceed with scheduling the dissertation proposal defense or they can ask the student to make changes to the proposal and to resubmit it. The dissertation proposal defense consists of the student presenting his or her proposed doctoral research and answering questions about the proposal, related background material and the material covered in all courses listed in the student's program of study. Majority approval of the Supervisory Committee is required to pass the defense. If a student fails the oral defense, he or she may be allowed to reinitiate the dissertation proposal once with the approval of the Supervisory Committee. Students who fail a second time or do not receive approval to resubmit the proposal will be administratively withdrawn from the program. After the student passes both the written and oral portions of the dissertation proposal, he or she is admitted to candidacy and should work on his or her proposed research. Major deviation from the proposed research requires majority approval of the Supervisory Committee.

Dissertation Requirements: The dissertation must be the result of independent and original research by the student and must constitute a significant contribution to the knowledge base of the focus area, equivalent to multiple peer-reviewed publications. The style and format of the dissertation are to conform to the standards of the Graduate College.

Dissertation Defense: A public defense of the dissertation is scheduled after the Supervisory Committee has reviewed a draft that is considered to be a nearly final version. The date of the defense is determined jointly by the Supervisory Committee and the student and must be consistent with any guidelines provided by the Graduate College. The first part of the defense will be a public oral presentation of the dissertation. The second part will be an oral exam administered by the Supervisory Committee who will decide whether the student passes or fails the defense. A student who fails the defense may be permitted to try again but failure a second time will result in dismissal from the PhD program.

Final Approval of the Dissertation: If the defense is completed with a result of pass, the Supervisory Committee prepares a statement describing final requirements such as additions or modifications to the dissertation and any additional requirements such as archival of data. When these requirements have been met to the satisfaction of the Supervisory Committee, the approval page of the dissertation is signed by the members of the Committee.

7. **Identify similar programs offered within Idaho or in the region by other colleges/universities.** *If the proposed request is similar to another state program, provide a rationale for the duplication.*

As shown in the following table, every research university in Idaho and adjacent states has one or more PhD programs that have similarities with the proposed program. However, only the University of Utah offers a PhD program in Computing, which is very similar in content and focus to the proposed program.

PhD Programs Similar to a PhD in Computing at Research Universities in States adjacent to Idaho (Includes institutions with the Carnegie Basic Classifications of "Research University [high research activity]" and "Research University [very high research activity]." Also includes Boise State University, which presently has the Carnegie Basic Classification of "Master's Universities [larger programs]")		
Idaho	Boise State University	PhD in Computing (proposed) with emphases in: >Computer Science >Computational Science and Engineering >Cyber Security
	Idaho State University	PhD in Engineering and Applied Science
	University of Idaho	PhD in Bioinformatics and Computational Biology PhD in Computer Science PhD in Mathematics
Montana	Montana State University	PhD in Computer Science PhD in Mathematics
	University of Montana	PhD in Mathematics
Nevada	University of Nevada Las Vegas	PhD in Computer Science PhD in Mathematical Sciences
	University of Nevada Reno	PhD in Computer Science and Engineering
Oregon	Oregon State University	PhD in Computer Science PhD in Mathematics
	Portland State University	PhD in Computer Science PhD in Mathematical Sciences
	University of Oregon	PhD in Computer and Information Science PhD in Mathematics
Utah	Brigham Young University	PhD in Computer Science PhD in Mathematics
	University of Utah	PhD in Computer Science PhD in Computing PhD in Mathematics
	Utah State University	PhD in Computer Science PhD in Mathematical Sciences
Washington	University of Washington	PhD in Computer Science and Engineering PhD in Mathematics
	Washington State University	PhD in Computer Science PhD in Mathematics
Wyoming	University of Wyoming	PhD in Computer Science PhD in Mathematics

Idaho State University offers a PhD program in Engineering and Applied Science. Although ISU's program involves various engineering and science departments, it does not focus on computing and therefore has little overlap with Boise State's proposed PhD in Computing.

The University of Idaho offers PhD programs in Computer Science, Mathematics, and Bioinformatics and Computational Biology.

- UI's PhD in Computer Science has a focus that is broadly similar what is contained in two emphases of the proposed program: the Computer Science emphasis and the Cyber Security emphasis. However, we regard the similarity in these programs as the basis for collaboration between UI and BSU.

- UI's PhD in Mathematics and PhD in Bioinformatics and Computational Biology have similarity with the Computational Science and Engineering emphasis of the proposed program. Neither of the UI's programs has the breadth of interdisciplinary structure of BSU's proposed program. The Mathematics program has an obvious disciplinary focus, and the Bioinformatics and Computational Biology program is focused on the domain of biology. BSU's proposed program will involve a broad science and engineering community with a broad set of perspectives and areas of expertise, and will include participants from the following departments at Boise State: Biological Sciences, Chemistry and Biochemistry, Civil Engineering, Computer Science, Electrical and Computer Engineering, Geosciences, Materials Science and Engineering, Mathematics, and Mechanical and Biomedical Engineering.

Furthermore, BSU's proposed program will have impacts that are not feasible for UI's programs: (i) BSU's program will fulfill the research and professional development needs of the high-tech industry in the Treasure Valley, and (ii) BSU's program will have major benefits for undergraduate and master's level students in existing BSU programs.

Degrees/Certificates offered by school/college or program(s) within disciplinary area under review

Institution and Degree name	Level	Specializations within the discipline (to reflect a national perspective)	Specializations offered within the degree at the institution
BSU Proposed: PhD in Computing	Doctoral	The proposed program includes the following three fields: computer science, computational science and engineering, and cyber security.	Transdisciplinary strengths in computer science and computational science, cyber security. Specific areas of specialization depend on the expertise of individual faculty members.
ISU PhD in Engineering and Applied Science	Doctoral	The program allows for a broad range of research topics in Engineering and Applied Science including Civil Engineering, Computer Science, Electrical Engineering, Environmental Engineering, Environmental Science and Management, Measurement and Control Engineering, Mechanical Engineering, and Nuclear Engineering including Health Physics, Chemistry, Geosciences, Mathematics, and Physics.	Specific areas of specialization depend on the expertise of individual faculty members from science and engineering departments.
UI PhD in Computer Science	Doctoral	There are various specialization areas such as artificial intelligence, bioinformatics, computer architecture, database, graphics, networks, programming languages, robotics/vision, social computing, security, software engineering, systems, theory and algorithms.	The UI Department of Computer Science website states that the research in the department focuses on Information Assurance and Computer Security, Collaborative Virtual Education, Evolutionary Computation, and Bioinformatics.
UI PhD in Mathematics	Doctoral	There are various specialization areas in mathematics, such as Algebra & Algebraic Geometry, Algebraic Topology, Analysis & PDEs, Geometry, Mathematical Logic & Foundations, Number Theory, Probability & Statistics, Representation Theory, Combinatorics, Applied Mathematics,	The UI Department of Mathematics website states the faculty members conduct research in the following areas: Algebra and Number Theory, Analysis and Differential Equations, Bioinformatics and Mathematical Biology, Combinatorics and Discrete

		Computational Science & Numerical Analysis.	Mathematics, Mathematics Education, Probability and Stochastic Processes.
UI **PhD in** **Bioinformatics** **and** **Computational** **Biology**	Doctoral	Description from CIP Code 26.1103 Bioinformatics: A program that focuses on the application of computer-based technologies and services to biological, biomedical, and biotechnology research. Includes instruction in algorithms, network architecture, principles of software design, human interface design, usability studies, search strategies, database management and data mining, digital image processing, computer graphics and animation, CAD, computer programming, and applications to experimental design and analysis and to specific quantitative, modeling, and analytical studies in the various biological specializations.	The UI Bioinformatics and Computational Biology website states that "Bioinformatics and Computational Biology (BCB) is a highly flexible interdisciplinary graduate program that prepares students to conduct research in academics, health sciences, agriculture, and other industries. The BCB program integrates research and coursework in computer sciences, biological sciences, and mathematical sciences." "…our students get the appropriate training that lead to successful careers in government, biotechnology, agriculture, biomedicine and academia."

8. **Describe the methodology for determining enrollment projections.** If a survey of student interest was conducted, attach a copy of the survey instrument with a summary of results as **Appendix B**. *This question is not applicable to requests for discontinuance.*

The enrollment projections are based on the following:
- The vast majority of students will be on funded assistantships, either state-funded teaching assistantships, research grant-funded research assistantships, or training grant-funded assistantships. A few students may become part-time without assistantship after they have finished the coursework and started a full-time job or part-time internship.
- It will typically take four years for a full time student to finish the program. Some full-time students admitted with an M.S. degree in the focus area may finish the program in three years. They may transfer up to 21 credits of the M.S. courses to the PhD program.
- Recruitment efforts will be more than sufficient to fill the incoming cohort.

The above assumptions yield the following results:
- About 8 students will graduate each year after the fourth year of the program.
- A total average enrollment of 45 students in the program at any one time once the program is fully up and running (43 by the fourth year).

Of those 45 enrolled, 35 will be on state-funded assistantships (including 15 existing positions in the Department of Computer Science) and a minimum of 10 will be on grant-funded assistantships (8 by the fourth year). The size of our incoming cohort will be adjusted in accordance with the number of grant-funded assistantships held by students. The following table shows the projected enrollments and assistantships in the first four years of the program.

	Fall 2016	Fall 2017	Fall 2018	Fall 2019
Existing state-funded assistantships	0	5	10	15
New state-funded assistantships	0	10	17	20
Grant-funded assistantships	2	4	6	8
Incoming students	2	17	14	10
Continuing students		2	19	33
Total enrollment	2	19	33	43

9. **Enrollment and Graduates.** Using the chart below, provide a realistic estimate of enrollment at the time of program implementation and over three year period based on availability of students meeting the criteria referenced above. Include part-time and full-time (i.e., number of majors or other relevant data) by institution for the proposed program, last three years beginning with the current year and the previous two years. Also, indicate the projected number of graduates and graduation rates.

Institution	Relevant Enrollment Data			Number of Graduates			Graduation Rate
	Current (Fall 2014)	Year 1 Previous	Year 2 Previous	Current (2014-15)	Year 1 Previous	Year 2 Previous	
BSU PhD in Computing	The program will begin in Fall 2016. We project an enrollment of approximately 45 once the program is fully up and running.			We project that first students will graduate from the program after 3-4 years in the program. We project an average of 8 graduates per year once the program is fully up and running.			~8 per year
ISU PhD in Engineering and Applied Science (all options)	21	28	31	2	4	5	~4
UI PhD in Computer Science	15	19	19	3	3	6	~4
UI PhD in Mathematics	6	5	11	1	2	3	~2
UI PhD in Bioinformatics and Computational Biology	17	16	14	2	5	1	~3

The first cohort of doctoral students admitted with an M.S. degree in their focus areas will graduate in May 2019, assuming a program start date of Fall 2016. Several students in the current MS programs in Computer Science and Mathematics have expressed strong interest in the PhD program.

10. **Will this program reduce enrollments in other programs at your institution?** If so, please explain.

It is unlikely because existing PhD programs have robust recruiting tools and funding. Creation of the new program will create a vibrant research and teaching culture that will attract undergraduates and additional Master's students.

11. **Provide verification of state workforce needs such as job titles requiring this degree.** Include State and National Department of Labor research on employment potential.
Using the chart below, indicate the total projected 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. T*his question is not applicable to requests for discontinuance*.

	Year 1	Year 2	Year 3
Local (Regional)	15	16	17
State	30	32	34
Nation	6,000	6,300	6,615

See below for the derivation of the national number of 6000 openings in year 1. The number of state openings is calculated as 0.5% of the national number; the local number is calculated as 50% of the state number.

a. Describe the methodology used to determine the projected job openings. If a survey of employment needs was used, please attach a copy of the survey instrument with a summary of results as **Appendix C.**

The proposed program will provide local, place-bound students with access to a program that will advance them professionally. The Treasure Valley is the home for a number of major IT companies (e.g., Micron, Clearwater Analytics, and HP), and educational institutions, each potentially with employees who would benefit. INL is a major employer of computing professionals with advanced degrees. INL has asked the Department of Computer Science to produce 7-10 graduates per year in cybersecurity alone.

To calculate the figures in the above table, we used national job openings and workforce need for PhD graduates in computer science, computational science, and cyber security. State need was calculated as 0.5% of the national need to reflect the percent of the nation's population in Idaho. Local regional need was calculated as 50% of the state need to reflect the percent of Idaho's population in the local area.

The following table shows the number of job openings in each emphasis area at www.indeed.com on June 2, 2015. The total is more than 6,000, which is used as the base number in the above table. A 5% increase is expected each year. The typical job titles requiring a PhD in computing include professor, computer scientist, data scientist, postdoc, system architect, and senior engineer.

Search term	Number of jobs
PhD Computer Science	5,272
PhD Computational Science	757
PhD Cyber Security	294

The market for computing jobs, especially cyber security, is growing rapidly. According to (ISC)[2] 2013 Global Information Security Workforce Study, cyber security jobs have grown 74% from 2007-2013. In 2013, there were 209,749 postings for cyber security-related jobs nationally and 434 in Idaho. They accounted for nearly 10% of all IT jobs. This growth rate is over 2x faster than all IT jobs. According to (ISC)[2] 2015 Global Information Security Workforce Study, the estimated shortfall in the global information security workforce will reach 1.5 million in five years. According to the 2014 Taulbee Survey by the Computing Research Association, only about 1,940 PhD graduates were produced in Computer Science, Computer Engineering, and Information systems in North America. As shown in Section 9, the existing related PhD programs in the state of Idaho only produce a few graduates.

b. Describe how the proposed change will act to stimulate the state economy by advancing the field, providing research results, etc.

First, the proposed program will stimulate the state economy by producing a more highly skilled

technical workforce for high-tech companies in the state. Jim Nottingham, Vice President and General Manager of Hewlett-Packard, Boise, explains in his letter of support that

> *"As one of the largest high-tech firms, and the largest single employer of software developers in the state of Idaho, it is vitally important to HP to have a large and sustained local pipeline of new, well-trained software engineering talent."*

Second, the new program will result in a substantial increase in federal grant funding; we conservatively estimate that the program, once fully up and running, will result in an increase of $2M in federal funding entering Idaho per year. Finally, strong graduate programs attract undergraduate students (including those from out of state) who are interested in eventually pursuing graduate degrees.

   c. Is the program primarily intended to meet needs other than employment needs, if so, please provide a brief rationale.

12. **Will any type of distance education technology be utilized in the delivery of the program on your main campus or to remote sites? Please describe.** *This question is not applicable to requests for discontinuance.*

   No.

13. **Describe how this request is consistent with the State Board of Education's strategic plan and institution's role and mission.** *This question is not applicable to requests for discontinuance.*

SBOE Strategic Plan	Relevance of proposed program
GOAL 1: A Well-educated Citizenry >Objective C: Higher Level of Educational Attainment – Increase successful progression through Idaho's educational system.	>The proposed program will provide local professionals with the opportunity to advance professionally.
GOAL 2: Innovation and Economic Development The educational system will provide an environment that facilitates the creation of practical and theoretical knowledge leading to new ideas. >Objective B: Innovation and Creativity – Increase creation and development of new ideas and solutions that benefit society.	>The proposed program will focus on research that will address important computing problems.
GOAL 3: Effective and Efficient Educational System – Ensure educational resources are coordinated throughout the state and used effectively. >Objective D: Productivity and Efficiency – Apply the principles of program prioritization for resource allocation and reallocation.	The proposed program: >will provide additional teaching capacity that will help alleviate bottleneck courses >builds on already strong master's programs >will enhance the quality of undergraduate and master's programs.

SBOE Strategic Plan for Research	Relevance of proposed program

GOAL 1: Increase research at, and collaboration among, Idaho universities and colleges to advance areas of research strength and opportunity.	The proposed program will increase Boise State's capacity for solving complex interdisciplinary computing problems
GOAL 2: Create research and development opportunities that strengthen the relationship between state universities and the private sector.	The proposed program will provide local IT companies access to the technical expertise necessary for data driven decision making.
GOAL 3: Contribute to the economic development of the State of Idaho.	The proposed program will produce graduates who will be skilled in developing algorithms, exploiting computing platforms, and designing analytics that turns data into knowledge to solve the problems that often are encountered when commercial enterprises seek to design new products, develop new services, and create novel approaches.
GOAL 4: Enhance learning and professional development through research and scholarly activity.	The proposed program will enable BSU to recruit high profile faculty who can enhance undergraduate and graduate students' experience in computing disciplines.

The highlighted portions of Boise State University's mission statement are especially relevant to the proposed program:

Boise State University is a public, metropolitan research university providing leadership in academics, research, and civic engagement. The university offers an array of undergraduate degrees and experiences that foster student success, lifelong learning, community engagement, innovation, and creativity. Research, creative activity and graduate programs, including select doctoral degrees, advance new knowledge and benefit the community, the state and the nation. The university is an integral part of its metropolitan environment and is engaged in its economic vitality, policy issues, professional and continuing education programming, and cultural enrichment.

The proposed program has substantial relevance to Boise State's core themes regarding Undergraduate Education, Graduate Education, and Research and Creative Activity, as described in the following table:

BSU Core Themes	Relevance of proposed program
Core Theme One: Undergraduate Education. Our university provides access to high quality undergraduate education that cultivates the personal and professional growth of our students and meets the educational needs of our community, state, and nation. We engage our students and focus on their success.	>The proposed program will provide additional teaching capacity, facilitating timely completion. >The research experience gained by undergraduate students will be highly relevant to their success. >The research experience gained by undergraduate students will increase the quality of education for those students.

Core Theme Two: Graduate Education. Our university provides access to graduate education that addresses the needs of our region, is meaningful in a global context, is respected for its high quality, and is delivered within a supportive graduate culture.	>The proposed program will provide opportunities for professional advancement for local professionals. >The program is focused on the solving of highly relevant problems. >The program will make use of "cluster" structure of student training to engage students in learning from a multidisciplinary perspective.
Core Theme Three: Research and Creative Activity. Through our endeavors in basic and applied research and in creative activity, our researchers, artists, and students create knowledge and understanding of our world and of ourselves, and transfer that knowledge to provide societal, economic, and cultural benefits. Students are integral to our faculty research and creative activity.	>The proposed program will provide relevant research to our key partner organizations as well as to other agencies, non-governmental organizations, etc., in the area. >Research pursued by graduate students and faculty members will focus on problems of high relevance. >The program builds on highly successful and high quality master's programs. Focus on quality is a key attribute of all doctoral programs at Boise State.

14. **Describe how this request fits with the institution's vision and/or strategic plan.** *This question is not applicable to requests for discontinuance.*

Goals of Institution Strategic Mission	Proposed Program Plans to Achieve the Goal
Goal 1: Create a signature, high quality educational experience for all students.	>The proposed program will be one-of-a-kind because of its transdisciplinary strengths. >It will enhance the quality of undergraduate programs, and will increase the quality of several master's programs.
Goal 2: Facilitate the timely attainment of educational goals of our diverse student population.	>A side benefit of the proposed program is an increase in the interdisciplinary courses.
Goal 3: Gain distinction as a doctoral research university.	>The proposed program will substantially increase the research output of faculty members, the reputation of the university, and the number of doctoral graduates.
Goal 4: Align university programs and activities with community needs.	>The proposed program will provide local computing professionals with opportunities for further education. >The program will increase the productivity of our key partners such as INL, Micron, HP, and Clearwater Analytics. >The program will provide research highly relevant to locally-based organizations.
Goal 5: Transform our operations to serve the contemporary mission of the university.	>Creating the proposed program follows directly from the tenets of program prioritization: the university should invest in the departments and programs (such as those of the Department of Computer Science) that are of the highest effectiveness and efficiency. >The program will have important collateral benefits in increasing efficiency and quality of existing undergraduate and graduate programs.

15. **Is the proposed program in your institution's Five-Year plan? Indicate below.** *This question is not applicable to requests for discontinuance.*

Yes _X_   No _____

If not on your institution's Five-Year plan, provide a justification for adding the program.

16. Explain how students are going to learn about this program and where students are going to be recruited from (i.e., within institution, out-of-state, internationally). *For requests to discontinue a program, how will continuing students be advised of impending changes and consulted about options or alternatives for attaining their educational goals?*

Recruitment to the program will be coordinated with the recruiting staff of the graduate college. Recruitment at a local level of local, place-bound professionals will occur primarily by informal contact between faculty members and those professionals and their organizations. We anticipate some recruitment of highly qualified Boise State undergraduate and master's-level students.

Because of the interdisciplinary nature of the program, we believe that the program will have broad appeal, enabling us to recruit students nationally and internationally as well. In the fields of computational science, computer science, and cyber security, students are motivated to apply to graduate programs because of the strength of faculty research and program reputation. Our recruitment plan has a 3-pronged approach for attracting high quality applicants: 1) support of faculty travel to professional conferences, 2) create a highly visible and informative web presence, and 3) support the visits of colleagues from external institutions. Faculty attendance at professional conferences serves several important functions for research, including networking to recruit students into labs. Students attend conferences to meet potential mentors, and conferences provide excellent opportunities for faculty members to meet applicants in-person and to judge the quality of their past research experience by attending oral or poster presentations. Also, potential applicants will likely make use of the internet to search for graduate programs. We intend to have a highly visible web presence, with up-to-date information on opportunities, success stories, and where-are-they-now information about graduates. Finally, we will host regular visits from colleagues at other research institutions to give seminars and have informal meetings with graduate students and faculty. Such visits are key to publicizing a strong and successful training program. These colleagues facilitate recruiting at their home institutions when they suggest their students apply to Boise State.

17. In accordance with Board Policy III.G., an external peer review is required for any new doctoral program. The peer review report is **Appendix C1**. The University's response is **Appendix C2.**

18. **Program Resource Requirements.** Using the **_Excel spreadsheet_** provided by the Office of the State Board of Education indicate all resources needed including the planned FTE enrollment, projected revenues, and estimated expenditures for the first three 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 budget explanations below. 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 the proposed discontinuance to include impacts to faculty (i.e., salary savings, re-assignments).

Note:
The budget for this program is focused on the new funding necessary to implement this program. The budget does not attempt the task of accounting for all of the fractions of FTEs for the existing faculty members who will participate in this program.

I. PLANNED STUDENT ENROLLMENT

	FY 17		FY 18		FY 19		FY 20	
	FTE	Headcount	FTE	Headcount	FTE	Headcount	FTE	Headcount
A. New enrollments	2	2	19	19	33	33	43	43
B. Shifting enrollments								

II. REVENUE

	FY 17		FY 18		FY 19		FY 20	
	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
1. New Appropriated Funding Reques	$0	$0	$625,178	$0	$1,318,583	$105,000	$1,473,182	$0
2. Institution Funds	$0	$0	$0	$0	$0	$0	$0	$0
3. Federal	$77,680	$0	$155,360	$0	$233,040	$0	$310,720	$0
4. New Tuition Revenues from Increased Enrollments	$0	$0	$0	$0	$0	$0	$0	$0
5. Student Fees	$0	$0	$0	$0	$0	$0	$0	$0
6. Other (i.e., Gifts)	$0	$0	$0	$0	$0	$0	$0	$0
Total Revenue	$77,680	$0	$780,538	$0	$1,551,623	$105,000	$1,783,902	$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 17 On-going	FY 17 One-time	FY 18 On-going	FY 18 One-time	FY 19 On-going	FY 19 One-time	FY 20 On-going	FY 20 One-time
A. Personnel Costs								
1. FTE	1.00	-	14.14	-	21.14	-	26.14	
2. Faculty	$0	$0	$56,893	$0	$58,600	$0	$60,358	$0.00
3. Adjunct Faculty	$0	$0	$0	$0	$7,418	$0	$7,418	$0.00
4A. Grad Assts: new state-funded	$0	$0	$260,000	$0	$442,000	$0	$520,000	$0.00
4B. Grad Assts: existing state funded	$0	$0	$10,000	$0	$20,000	$0	$30,000	$0
4C. Grad Assts: grant funded	$52,000	$0	$104,000	$0	$156,000	$0	$208,000	$0
5. Research Personnel	$0	$0	$0	$0	$0	$0	$0	$0.00
6. Directors/Administrators	$0	$0	$70,696	$0	$86,869	$0	$89,475	$0.00
7. Administrative Support Personnel	$0	$0	$35,000	$0	$231,050	$0	$237,982	$0.00
8A. Fringe Benefits: state funded		$0	$69,588	$0	$159,797	$0	$165,700	$0.00
8B: Fringe Benefits: grant funded	$2,080	$0	$4,160	$0	$6,240	$0	$8,320	$0
9. Other:								
Grad Asst Tuition & Insurance								
for New state funded Grad Assts	$0	$0	$118,000	$0	$200,600	$0	$236,000	$0
for grant funded Grad Assts	$23,600	$0	$47,200	$0	$70,800	$0	$94,400	$0.00
Total Personnel and Costs	$77,680	$0	$775,537	$0	$1,439,373	$0	$1,657,652	$0.00

INSTRUCTION, RESEARCH AND STUDENT AFFAIRS
JUNE 16, 2016

	FY 17		FY 18		FY 19		FY 20	
	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
B. Operating Expenditures								
1. Travel	$0	$0	$2,500	$0	$33,500	$0	$47,500	$0
2. Professional Services	$0	$0	$0	$0	$0	$0	$0	$0
3. Other Services	$0	$0	$0	$0	$0	$0	$0	$0
4. Communications	$0	$0	$0	$0	$0	$0	$0	$0
5. Materials and Supplies	$0	$0	$2,500		$2,500	$0	$2,500	$0
6. Rentals	$0	$0	$0	$0	$0	$0	$0	$0
7. Materials & Goods for Manufacture & Resale	$0	$0	$0	$0	$0	$0	$0	$0
8. Miscellaneous	$0	$0	$0	$0	$0	$0	$0	$0
Total Operating Expenditures	$0	$0	$5,000	$0	$36,000	$0	$50,000	$0

	FY 17		FY 18		FY 19		FY 20	
	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
C. Capital Outlay								
1. Library Resources	$0	$0	$0	$0	$50,000	$0	$50,000	$0
2. Equipment	$0	$0	$0	$0	$26,250	$105,000	$26,250	$0
Total Capital Outlay	$0	$0	$0	$0	$76,250	$105,000	$76,250	$0
D. Capital Facilities Construction or Major Renovation								
E. Indirect Costs (overhead)								
Utilites								
Maintenance & Repairs								
Other								
Total Indirect Costs	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL EXPENDITURES:	$77,680	$0	$780,537	$0	$1,551,623	$105,000	$1,783,902	$0
Net Income (Deficit)	$0	$0	$1	$0	$0	$0	$0	$0

Notes:

I.A.	Most if not all of the students in the program will be full-time; therefore the FTE count is equal to the headcount
II.1.	Funding anticipated from FY18 Line Item request to the Idaho State Legislature.
III.A.8	Fringe benefits calculated as (.2119* salary) for administrators who are already existing employees;
	(.2119*salary + 11,200) for new support staff; (0.07*salary) for graduate assistants
III.A.4.,9.	Graduate assistantships @$26,000 yearly stipend, $8166 yearly tuition, $3,000 insurance.
III.B.1	"Travel" includes funds for recruiting and for external speakers
III.B.5.	PCs for GAs and new hires, including 4 year replacement cycle.
III.C.1	Funds for new periodicals and/or databases
III.C.2.	Funds for (i) initial setup of cybersecurity laboratory plus 4 year replacement cycle,
	(ii) Educational High Performance Computing laboratory plus 4 year replacement cycle
	(iii) Research High Performance Computing laboratory plus 4 year replacement cycle.

a. Personnel Costs

Faculty Expenditures

Project for the first three years of the program the credit hours to be generated by each faculty member (full-time and part-time), graduate assistant, and other instructional personnel. Also indicate salaries. After total student credit hours, convert to an FTE student basis. Please provide totals for each of the three years presented. Salaries and FTE students should reflect amounts shown on budget schedule.

Faculty				
Name, Position & Rank	Annual Salary Rate	FTE Assignment to this Program	Projected Student Credit Hours	FTE Students
One new Tenure-track faculty line in Mathematics	$56,893	Unknown at this time	Unknown at this time	Unknown at this time
Faculty: Except for the above position, the proposed program will make use of existing faculty lines (see below)				

Existing faculty lines that will participate in the program are as follows. The Curricula Vitae for faculty members can be found in Appendix E.

Computer science emphasis:
        Tim Andersen, Computer Science
        Jim Buffenbarger, Computer Science
        Steven Cutchin, Computer Science
        Bogdan Dit, Computer Science
        Jerry Fails, Computer Science
        Amit Jain, Computer Science
        Maria (Sole) Pera, Computer Science
        Edoardo Serra, Computer Science
        Elena Sherman, Computer Science
        Francesca Spezzano, Computer Science
        Jidong Xiao, Computer Science
        Dianxiang Xu, Computer Science
        Jyh-Haw Yeh, Computer Science
        New hires, 5, Computer Science

Computational science & engineering emphasis:
        Eric Hayden, Biological Sciences
        Julia Oxford, Biological Sciences
        Kevin D. Ausman, Chemistry and Biochemistry
        Clifford B. LeMaster, Chemistry and Biochemistry
        Owen McDougal, Chemistry and Biochemistry
        Bhaskar Chittoori, Civil Engineering
        Arvin Farid, Civil Engineering
        Jairo Hernandez, Civil Engineering
        Deb Mishra, Civil Engineering
        Yang Lu, Civil Engineering
        Tim Andersen, Computer Science
        Bogdan Dit, Computer Science
        Amit Jain, Computer Science
        Alejandro Flores, Geosciences
        Nancy Glenn, Geosciences
        Dylan Mikesell, Geosciences
        Will Hughes, Materials Science and Engineering

Eric Jankowski, Materials Science and Engineering
Lan Li, Materials Science and Engineering
Donna Calhoun, Math
Kyungduk Ko, Math
Jaechoul Lee, Math
Jodi Mead, Math
Partha Mukherjee, Math
Leming Qu, Math
Grady Wright, Math
Barbara Zubik, Math
Joe Guarino, Mechanical and Biomedical Engineering
Trevor Lujan, Mechanical and Biomedical Engineering
Inanc Senocak, Mechanical and Biomedical Engineering

Cyber security emphasis:
Yang Lu, Civil Engineering
Sondra Miller, Civil Engineering
Jim Buffenburg, Computer Science
Gaby Dagher, Computer Science
Edoardo Serra, Computer Science
Jidong Xiao, Computer Science
Dianxiang Xu, Computer Science
Jyh-haw Yeh, Computer Science
New hires, 2, Computer Science
Hao Chen, Electrical and Computer Engineering
Liljana Babinkostova, Math
Marion Scheepers, Math

Staff Expenditures

Project the need and cost for support personnel and any other personnel expenditures for the first three years of the program.

Four new staff positions will support the proposed program. Start date for each can be found in the table below. Salaries are assumed to increase by 3% per year.

Support Staff			
Name, Position & Rank	**Annual Salary Rate**	**FTE Assignment to this Program**	**Value of FTE Effort to this Program**
IT administrator (new) (start FY19)	$75,000	1.0	$75,000
Graduate Program manager (new) (Start FY19)	$70,000	1.0	$70,000
Accountant (new) (Start FY18)	$50,000	1.0	$50,000
Administrative Asst II (new) (Start FY18)	$35,000	1.0	$35,000

Graduate Assistant Expenditures

Twenty new graduate assistantships will be created as part of the new program. Fifteen additional already-funded assistantships in the Department of Computer Science will be brought to the same stipend level as those being newly created. We project that at least ten additional assistantships will be funded by grants.

Graduate Assistantships			
Name, Position & Rank	**Annual Salary Rate**	**FTE Assignment to this Program**	**Value of FTE Effort to this Program**
20 new Graduate Assistantships funded on state appropriated dollars (FY18 start 10; FY19 start 7; FY20 start 3)	$26,000 each	1.0 each	$26,000 each
15 Graduate Assistantships that are already funded on state appropriated dollars in the Dept of Computer Science at $24k per year. (FY18 start 5; FY19 start 5; FY20 start 5)	$26,000 each (requiring an increase of $2k per GA)	1.0 each	$26,000 each
Eventually, 10 graduate assistantships funded via grants	$26,000 each	1.0 each	$26,000 each

Administrative Expenditures

Describe the proposed administrative structure necessary to ensure program success and the cost of that support. Include a statement concerning the involvement of other departments, colleges, or other institutions and the estimated cost of their involvement in the proposed program

We will establish the same number of months of compensation for the Chair of the Department of Computer Science as now exists for the Chair of the Department of Mathematics by increasing the Computer Science Chair's contract from 10 months to 12 months. We will create two new administrative positions that will be occupied by faculty members, a PhD Program Coordinator position and an Inter-Departmental Liaison; the former will receive three additional months of salary and the latter will receive one additional month of salary. The Inter-Departmental Liaison will be an existing faculty member from a home department other than that of the Program Coordinator; he/she will facilitate inter-departmental participation and coordination. We will also add one month of summer salary for the Associate Chair of Mathematics to enable that person to handle the increase in workload associated with the proposed program. All salaries are assumed to increase 3% per year.

Name, Position & Rank	**Annual Salary Rate**	**FTE Assignment to this Program**	**Value of FTE Effort to this Program**
Computer Science Department Chair (two months of salary will be added to existing contract) (begins FY18)	$127,058 for 10 mo.; to be increased to 12 mo	2 months	$25,412
PhD Program Coordinator (three months of salary will be added to existing contract) (2 months extra begins FY18; 3 months begins FY19)	$122,781 for 9 mo.; to be increased to 12 months	2 months FY18; 3 months subsequently	$40,927
Inter-Departmental Liaison (begins FY18)	$81,000 for 9 mo.; to be increased to 10 months	1 month	$9,000
Mathematics Department Associate Chair (one month salary to be added to existing contract) (begins FY19)	$81,000 for 9 mo.; to be increased to 10 months	1 month	$9,000

b. Operating Expenditures

Briefly explain the need and cost for operating expenditures (travel, professional services, etc.)

Travel funds will be used for recruiting of students and for external speakers. "Materials and supplies" will consist of desktop computers for graduate assistants and new hires, including a 4 year replacement cycle.

c. Capital Outlay
(1) Library resources
    (a) Evaluate library resources, including personnel and space. Are they adequate for the operation of the present program? If not, explain the action necessary to ensure program success.
    (b) Indicate the costs for the proposed program including personnel, space, equipment, monographs, journals, and materials required for the program.
    (c) For off-campus programs, clearly indicate how the library resources are to be provided.

Library resources are generally sufficient for the program. An additional $50,000 (beginning in FY19) in the budget will help ensure that sufficiency.

(2) Equipment/Instruments
Describe the need for any laboratory instruments, computer(s), or other equipment. List equipment, which is presently available and any equipment (and cost) which must be obtained to support the proposed program.

The proposed Ph.D. requires a cyber security laboratory to support the cyber security emphasis and a high-performance computing laboratory to support the computational science and engineering emphasis. The cyber security laboratory is a computer network that consists of 2 servers, 30 desktops, 1 firewall, and 1 IDS/IPS. It will be used by the new cyber security courses and cyber security research projects. The high-performance computing laboratory is a 32-node cluster with parallel file storage, HPC job scheduler, Bright Cluster Management Software, Intel Software Development Suite (C/C++, Fortran), ANSYS Simulation Software, and other educational software.

d.   Revenue Sources

(1) 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?
N/A

(2) If the funding is to come from other sources such as a donation, indicate the sources of other funding. What are the institution's plans for sustaining the program when funding ends?
N/A

(3) 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.

Boise State University will submit a Line Item Request for the FY18 state budget that will include expenses listed in the budget of this proposal for FY18; full success in that request would result in implementation of the program on the scale and timeline described in this proposal. If not fully funded, the program will be implemented to the extent feasible with existing department resources and reallocated resources. At present we have the faculty and most of the graduate assistantships necessary to implement two emphases of the program: Computer Science and Cyber Security.

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

A number of the faculty members who will participate in the program are successful at securing federal grants. We include an estimate that eventually ten graduate assistantships will be funded by grants. The bulk of funding for the program is on state appropriations, so the termination of funding from federal grants for those graduate assistantships would have minimal impact on the program.

(5) Provide estimated fees for any proposed professional or self-support program.
N/A

List of Appendixes:

Appendix A: Curriculum

Appendix B: External Reviewers Report

Appendix C: Response to external reviewer's report

Appendix D: Letters of Support

Appendix E1: Computer Science Emphasis: Curricula Vitae for Participating Faculty

Appendix E2: Computational Science and Engineering Emphasis: Curricula Vitae for Participating Faculty

Appendix E3: Cyber Security Emphasis: Curricula Vitae for Participating Faculty

Appendix A: Curriculum

1. General Curriculum

Doctor of Philosophy in Computing	
Course Number and Title	*Credits*
Emphasis courses approved by the supervisory committee and the program coordinator. Select one from the following three emphases: Computational Science & Engineering Computer Science Cyber Security	18
Additional emphasis courses and/or elective courses approved by the supervisory committee and the program coordinator	18-24
CS 691 Doctoral Comprehensive Examination	1
CS 693 Dissertation	24-30
Total	67

2. Courses for the Computer Science Emphasis

Doctor of Philosophy in Computing Computer Science Emphasis	
Course Number and Title	*Credits*
Choose 12 courses from the following Emphasis Courses and Elective Courses. At least 6 courses must be chosen from the Emphasis Courses	36
Emphasis Courses CS 510 Databases (3 cr) CS 521 Design and Analysis of Algorithms (3 cr) CS 530 Parallel Computing (3 cr) CS 531 Advanced Programming Languages (3 cr) CS 541 Computer Architecture (3 cr) CS 552 Operating Systems (3 cr) CS 555 Distributed Systems (3 cr) CS 557 Artificial Intelligence (3 cr) CS 561 Theory of Computation (3 cr) CS 571 Software Engineering (3 cr)	
Elective Courses CS 512 Advanced Topics In Databases (3 cr) CS 525 Computer Networks (3 cr) CS 534 Data Science and Analytics (3 cr) CS 546 Computer Security (3 cr) CS 550 Programming Language Translation (3 cr) CS 551 Advanced Topics in Compilation (3 cr) CS 554 Advanced Operating Systems (3 cr) CS 564 Visualization Techniques (3 cr)	

CS 572 Object-Oriented Design Patterns (3 cr) CS 573 Advanced Software Engineering (3 cr) CS 574 Advanced Software Quality (3 cr) CS 575 Software Security (3 cr) CS 621 Digital Forensics (3 cr) CS 622 Advanced Network Security (3 cr) CS 623 Cyber Physical Systems (3 cr) CS 624 Cyber Security of Critical Infrastructures (3 cr) Additional elective courses approved by the supervisory committee	
CS 691 Doctoral Comprehensive Examination	1
CS 693 Dissertation	30
Total	67

3. Courses for the Computational Science & Engineering Emphasis

Doctor of Philosophy in Computing Computational Science & Engineering Emphasis	
Course Number and Title	*Credits*

Required Core Courses
MATH 527 Intro to Applied Math for Scientists & Engineers (3 cr)
CS 565/MATH 565 Numerical Methods I (3 cr)
CS 566/MATH 566 Numerical Methods II (3 cr)
MATH 572 Computational Statistics (3 cr)
CS 507 Computing Foundations for Computational Science (3 cr)
Choose one of:
    CS 530 Parallel Computing (3 cr)
    ME 571 Parallel Scientific Computing (3 cr)
	18

Elective Courses *Graduate-level elective courses:* Six graduate-level elective courses are required. Three of them must be chosen from science or engineering departments. *Undergraduate-level elective courses*: Up to two upper division undergraduate elective courses outside the major field of study can be used for credit towards the degree.	18-24 18 0-6
CS 691 Doctoral Comprehensive Examination	1
CS 693 Dissertation	24-30
Total	67

4. Courses for the Cyber Security Emphasis

Doctor of Philosophy in Computing Cyber Security Emphasis	
Course Number and Title	*Credits*
Choose 12 courses from the following Emphasis Courses and Elective Courses. At least 6 courses must be chosen from the Emphasis Courses	36
Emphasis Courses CS 552 Operating Systems (3 cr) CS 546 Computer Security (3 cr) CS 575 Software Security (3 cr) CS 621 Digital Forensics (3 cr) CS 622 Advanced Network Security (3 cr) CS 623 Cyber Physical Systems (3 cr) CS 624 Cyber Security of Critical Infrastructures (3 cr) MATH 508 Advanced Public Key Cryptology (3 cr) MATH 509 Symmetric Key Cryptology (3 cr) MATH 585 Topics in Cryptology (3 cr)	
Elective Courses CS 510 Databases (3 cr) CS 512 Advanced Topics In Databases (3 cr) CS 521 Design and Analysis of Algorithms (3 cr) CS 525 Computer Networks (3 cr) CS 530 Parallel Computing (3 cr) CS 534 Data Science and Analytics (3 cr) CS 541 (ECE 532) Computer Architecture (3 cr) CS 550 Programming Language Translation (3 cr) CS 551 Advanced Topics in Compilation (3 cr) CS 554 Advanced Operating Systems (3 cr) CS 555 Distributed Systems (3 cr) CS 557 Artificial Intelligence (3 cr) CS 561 Theory of Computation (3 cr) CS 564 Visualization Techniques (3 cr) CS 572 Object-Oriented Design Patterns (3 cr) CS 574 Advanced Software Quality (3 cr) MATH 505 Abstract Algebra (3 cr) MATH 507 Number Theory (3 cr) Additional elective courses approved by the supervisory committee	
CS 691 Doctoral Comprehensive Examination	1
CS 693 Dissertation	30
Total	67

Appendix B: External Reviewers Report

BOISE STATE UNIVERSITY

SITE VISIT REPORT

Reviewing the proposal for

Doctor of Philosophy (PhD) in Computing

with emphases in

Computer Science,
Computational Science and Engineering,
and Cyber Security

College of Engineering
College of Arts and Sciences

Departments of Computer Science, Mathematics, Biological Sciences,
Chemistry and Biochemistry, Civil Engineering, Geosciences,
Material Science and Engineering, and Mechanical and Biomedical Engineering

Mike Kirby, University of Utah
Dan Watson, Utah State University

8 December 2015

A. Executive Summary

Based upon the proposal, letters, and industrial interviews, the committee acknowledges the need for an interdisciplinary program in Computing at BSU. The goal of such a program is to produce PhDs filling a focused but necessary need in the community. The PhD program is critical in attracting high quality faculty and researchers. These types of individuals are essential for building a high-quality undergraduate program that meets the needs of state and local industrial partners in the Treasure Valley. It is our recommendation that such a program be instituted at BSU.

The committee finds the academic acumen of the currently affiliated BSU faculty to be well-positioned to take this important next step in the evolution of their program. The committee agrees that the introduction of a PhD-level computing program is timely and needed, and that the three selected initial tracks are relevant and will be long-lived. The committee also agrees that the addition of a Data Analytics track is the next logical progression in the development of this program.

The committee has reviewed the current hiring plan for the previously-funded faculty hiring efforts, and finds it to be both appropriate and effective in the program's long-term goals. We believe that the plan presented to the committee, amended to account for our recommendations, is the best way to achieve critical mass quickly in terms of faculty collaboration and involvement, attraction of high-quality students, and industry engagement and regional growth.

The committee finds that the academic-industrial relationship is notably strong and an integral part of the institutional culture of BSU, as exemplified by the reciprocal relationship between: on the one hand, adjunct lecturers from local industries, and on the other hand, student internship participation that increases real-world awareness of technical knowledge. Having this relationship with BSU as a focal point facilitates the attraction of professionals from the broader region to relocate to the Boise area, and provides an impetus for continuing education opportunities for these professionals as they settle here.

In conclusion, we recommend that the Colleges of Engineering and Arts and Sciences at BSU move forward with the proposed PhD in Computing at the earliest feasible opportunity. We look forward to its successful implementation.

B. Review Process

Drs. Mike Kirby (Professor of Computing and Associate Director of the School of Computing, University of Utah) and Dan Watson (Associate Professor and Head of the Department of Computer Science, Utah State University) met on December 7 and 8, 2015 on the Boise State University Campus to review the proposed PhD Program in Computing. Prior to the site visit on December 7 and 8, the team was provided for review the ISBE proposal form, support letters, faculty curricula vitae, and a memorandum to Dr. Jack Pelton, Graduate College Dean about the Organizational Structure for the PhD in Computing.

On December 7, the review team met with administrators Dr. Marty Schimpf (Provost and Vice President for Academic Affairs), Dr. Amy Moll (Dean of the College of Engineering), Dr. Tony Roark (Dean of the College of Arts and Sciences), Dr. Jim Munger (Vice Provost, Academic Planning), and Dr. Pelton.   Additionally, the committee met with department chairs and graduate program coordinators Dr. Tim Andersen (Chair, Department of Computer Science), Dr. Dianxiang Xu (Graduate Program Coordinator, Department of Computer Science), and Dr. Jodi Mead (Graduate Program Coordinator, Department of Mathematics). Subsequent discussions included many of the

faculty and staff of the participating academic units as well as regional industry representatives and current graduate students at BSU.

Drs. Andersen and Mead conducted a tour of relevant facilities in the afternoon, and unstructured time was provided for the committee to prepare the final report on December 7, at the end of which this report was presented with debrief and discussion to Dr. Schimpf, Dr. Munger, Dr. Moll, Dr. Roark, Dr. Andersen, Dr. Xu, Dr. Mead, and Dr. Pelton on their recommendations.

C. Observations

Boise State University is a rapidly growing university serving a large metropolitan area of more than half million people. The strategic location of the University in the Treasure Valley amongst both government entities as well as businesses will most likely support further developments within individual schools and colleges, as well as cross-college programs such as the one that has been proposed. Through the review process outlined above, the committee makes the following observations for consideration by the BSU administration:

1. The committee acknowledges that the computer science track within the program is more closely tied with an existing department, whereas the other two currently proposed tracks (CS&E and Cyber-security) are more interdisciplinary by construction. Our observation was noted both in the proposal and confirmed by the letters of support.

2. Industry representatives emphasized that although soft skills do not supercede technical pursuits, but rather augment them in the pursuit of brevity, clarity, and effectiveness – program leadership should seek opportunities for the refinement of these important professional competencies.

3. Having met with the faculty of a newly-formed leadership cohort in the Molecular Biology (BMol) program at BSU, the committee discerned and agreed with several principles that the BMol leadership advised:

    a. *Transparency* is key in maintaining a cooperative atmosphere among all participants, both in current actions and strategic goals articulated by the Faculty Steering Committee.

    b. Of equal importance is the acknowledgement of inequities in items such as faculty compensation, space, and students stipends. That acknowledgement should lead to the encouragement of workload policies that are commensurate with the activities of the participants.

4. The committee finds the proposed library budget dedicated to the procurement of area-related academic journals and access to long-term data housing to be of an appropriate level for this endeavor and well within the scope of the proposed program.

5. The committee reviewed the strategic space plan at the level of faculty offices, student workspace, computational infrastructure, common meeting areas, and strategic placement within the industrial environment. We find that the new Computer Science space planned for the downtown area is sufficient to meet most of these goals in excellent fashion. However, the review committee remains concerned that there will be a perceived extended distance between the CS facilities and the other participating academic units, and that care must be taken to preserve ownership and collegiality among all faculty. Additionally, the committee notes that the scheduled student workspace seems oversubscribed, and at odds with the stated goals of the program. We believe an important aspect that will require more attention as the program grows is the adequate dedicated lab space for research-related groups of students to work together. The committee

notes, based on its own research enterprise experience, that groups of three to five students will be the most productive in terms of synergistic growth toward new innovation.

6. The committee reviewed the computational infrastructure and finds it adequate for the initial needs of initiating the program, but not sufficient for sustaining the eventual growth of the program. The aforementioned space with respect to power and cooling is more than adequate, but ongoing funding will be an important consideration in expanding the set of computation resources both in High-Performance Computing (HPC) and High-Throughput Computing (HTC) that will be needed as the CS&E and Data Analytics endeavors mature.

D. Recommendations

Through the review process outlined above, the committee makes the following recommendations for consideration by the BSU administration:

1. The committee recommends that memorandums of understanding be drafted that specify that the creation of this program does not preclude the proposal of discipline-centric PhD programs in the participating academic units.

2. The committee recommends a long-term hiring plan broadly considering the tracks within the program that requires coordination between the participating departments and colleges. Specifically, a long-term goal bolstering the Computer Science faculty to be engaged in the CS&E track is needed for the eventually success of the program.

3. The committee is troubled by the mixed composition of faculty representation and track representation on the Faculty Steering Committee and believes this may serve as a source of tension in decision-making because of the preponderance of CS department affiliations. The committee recommends a structure based on the Molecular Biology program that relies on a more uniform departmental representation.

4. The committee recommends that the assignment of GAs under the purview of the Faculty Steering Committee be carefully maintained to accommodate the continued well-being of the program, The committees believes the level of GA support to be adequate for the initial formation of the program, but planning for augmentation of the GA support will be needed long-term.

5. Allocation of student travel funds will play an important role in the recruitment of top-tier student researchers. The committee recommends that student travel be an integral budgeted part of the recruitment plan for both student and potential faculty.

6. Based on meetings with faculty (and, in particular, with graduate students), the committee recommends a more comprehensive codification of their due progress plan, including timelines and milestones, comprehensive exam administration, committee alteration process, appropriate recognition of progress in the student termination process (e.g., awarding of a Masters of Computer Science), feedback mechanisms to students on completion of milestones, clearly articulated power-of-enforcement, and well-defined grievance and appeal process.

7. The committee recommends that a framework for a continuous improvement process be developed to encourage regular review and refinement of the program and its methods.

Appendix C: Response to Report of External Reviewers

1. **Review Committee Recommendation:** The committee recommends that memorandums of understanding be drafted that specify that the creation of this program does not preclude the proposal of discipline-centric PhD programs in the participating academic units.

   Response: The proposed program focuses on the interdisciplinary computing aspects of the science and engineering disciplines. The university deans and central administration, the Graduate Council, and the Graduate College do not preclude the development of PhD programs in any discipline or department, including the disciplines and departments whose faculty members will participate in the proposed PhD Computing program. Rather, as a guiding principle, the university chooses to focus doctoral program development in those areas of research strength that mesh with the mission of the university and the needs of the community.

2. **Review Committee Recommendation:** The committee recommends a long-term hiring plan broadly considering the tracks within the program that requires coordination between the participating departments *and* colleges. Specifically, a long-term goal bolstering the Computer Science faculty to be engaged in the CS&E track is needed for the eventually success of the program.

   Response: We plan to create joint faculty appointments between the Computer Science Department and other science and engineering departments, particularly for the CS&E track.

3. **Review Committee Recommendation:** The committee is troubled by the mixed composition of faculty representation and track representation on the Faculty Steering Committee and believes this may serve as a source of tension in decision-making because of the preponderance of CS department affiliations. The committee recommends a structure based on the Molecular Biology program that relies on a more uniform departmental representation.

   Response: The original composition of the Faculty Steering Committee has been revised to better ensure balanced faculty representation across tracks and participating departments. In addition, the mechanism for appointment to the committee is designed with sufficient flexibility to achieve the desired balance, and a general meeting of the faculty participants will be held each fall and spring semester to provide opportunities for direct input to the program director and steering committee.

4. **Review Committee Recommendation:** The committee recommends that the assignment of GAs under the purview of the Faculty Steering Committee be carefully maintained to accommodate the continued well-being of the program. The committee believes the level of GA support to be adequate for the initial formation of the program, but planning for augmentation of the GA support will be needed long-term.

   Response: The new GAs to be established in support of the proposed PhD Computing program will be managed by the Faculty Steering Committee according to processes approved by the faculty participants. The deans of the participating colleges are responsible for the overall health and performance of the program, including monitoring of the adequacy of GA support, especially in comparison to peer and aspirational PhD programs in the United States. The university addresses the sufficiency of GA support through central allocation of state funding for teaching assistantships, through external funding opportunities such as research grants and traineeships identified with the help of the Division of Research and Economic Development, through partnerships with external organizations having special interest in the students enrolled in the program, and through endowed scholarships and fellowships, especially in research areas targeted by the private sector.

5. **Review Committee Recommendation:** Allocation of student travel funds will play an important role in the recruitment of top-tier student researchers. The committee recommends that student travel be an integral budgeted part of the recruitment plan for both student and potential faculty.

   Response: We have included the travel funds for prospective students to visit campus (please refer to budget item III.B.1).

6. **Review Committee Recommendation:** Based on meetings with faculty (and, in particular, with graduate students), the committee recommends a more comprehensive codification of their due progress plan, including timelines and milestones, comprehensive exam administration, committee alteration process, appropriate recognition of progress in the student termination process (e.g., awarding of a Masters of Computer Science), feedback mechanisms to students on completion of milestones, clearly articulated power-of-enforcement, and well-defined grievance and appeal process.

   Response: We have revised the proposal to address these issues. Below is a summary of relevant revisions.

   Timelines and milestones (Refer to Section 3)
   The milestones of the PhD study include appointment of a major advisor and supervisory committee, formulation of plan of study, completion of course work, completion of the comprehensive examination, dissertation proposal defense, and final dissertation defense. The major advisor is appointed when the student is admitted to the program. An Appointment of Supervisory Committee form should be submitted within the first semester. A student must take the comprehensive examination no later than student completing 36 credits of course work in the program. Once the student has passed the comprehensive examination, the student is eligible to defend their dissertation proposal. The dissertation proposal should be defended within one year after the completion of the comprehensive examination and two semesters before the final dissertation defense. After successful proposal defense, the student is recommended for Advancement to Candidacy.

   Comprehensive Examination (Refer to Section 6)
   The objective of the comprehensive examination is to judge depth and breadth of knowledge. The student must enroll in CS 691 Doctoral Comprehensive Examination for the semester during which they plan to take the comprehensive examination. The comprehensive examination includes a written portion and an optional oral portion. The need for the oral portion is determined by the supervisory committee. The written portion consists of written responses to a series of questions from three topical areas approved by the supervisory committee. The student must submit the selected topic areas to the program director for approval within the first four weeks of the semester. The questions are designed and graded by the instructors who taught the topic courses in the most recent years. The instructors in consultation with the faculty steering committee will determine if the student passes or fails. If a student fails the initial written examination, the student is allowed to retake the parts of the examination they did not pass one time. This must be done the next time the examination is offered. The oral portion of the examination, if required by the supervisory committee, should be conducted within the same semester as the written portion. In this case, the student needs to pass both the written and oral portions. During the oral exam students are expected to demonstrate solid, in–depth, academic knowledge related to the focus area. The decision of whether a student passes or fails the oral exam rests with the supervisory committee members. If a student fails the initial oral exam, the supervisory committee has the option of allowing a student to repeat the oral exam one time. If a repeat oral exam is granted by the supervisory committee, it must occur within the next semester (not including summer) of the initial oral examination. Failure of the comprehensive examination will result in dismissal from the PhD program.

Committee Alteration Process (Refer to the Supervisory Committee paragraph in Section 3)
A change of the major advisor or supervisory committee member can be made after initial appointment. The Appointment of Supervisory Committee form should be submitted to and approved by the program director and the graduate college.

Appeal Process (Refer to Section 3)
Students have the right to file a written appeal regarding the decisions on their comprehensive examination, dissertation proposal defense, and final dissertation defense. The faculty steering committee serves as an appeal mechanism for decisions made by student's supervisory committee. The program director offers an appeal mechanism for decisions and recommendations of the faculty steering committee. The Boise State University Graduate Council and Graduate Dean serves an appeal mechanism for decisions made by the program director.

Master's Degree Option (Refer to Section 3)
A doctoral student who has failed the comprehensive exam, the proposal/dissertation defense, or under special circumstances, may petition to the program for approval to transfer to a related Master's program.

7. **Review Committee Recommendation:** The committee recommends that a framework for a continuous improvement process be developed to encourage regular review and refinement of the program and its methods.

   Response: The program will undergo an annual assessment that includes exit interviews of graduating students, compilation of student publications, bibliometrics, awards, and special activities (such as internships, workshops, and extended visits to other institutions), monitoring of initial post-graduate employment and ongoing career development, and key metrics of the student pipeline including data for admission, enrollment, degree progress, overall time-to-degree, student financial support, and attrition (including analysis of reasons for attrition). This assessment is the responsibility of the program director assisted by Institutional Research and the Graduate College, and results in a report to the deans of the participating colleges. The report must include a description of previous actions used to improve the program, the results of those actions, and any newly recommended or modified actions to be undertaken by the program in response to the most recent assessment. The deans are responsible for discussing the report with the provost and for administrative actions necessary for implementation of the improvement plan by the program.

Appendix D: Letters of Support

Name	Position	Agency/Company/University	Page
Jim Nottingham	Vice President and General Manager LES Value HW and Technology	Hewlett Packard	2
Brad Richy	Chief of Idaho Bureau of Homeland Security and Director of the Joint Staff	Bureau of Homeland Security	4
Brent Stacey	Associate Laboratory Director National and Homeland Security	Idaho National Laboratory	5
J.R. Tietsort	Chief Information Security Officer	Micron	6
Rich Stuppy	Chief Operating Officer	Kount	7
Sean Vincent	Hydrology Section Manager	State of Idaho Department of Water Resources	8
Andrew Slaughter	Research and Development Scientist/Engineer	Idaho National Laboratory	9
Somantika Datta	Assistant Professor, Department of Mathematics	University of Idaho	10
Lyudmyla L. Barannyk	Assistant Professor, Department of Mathematics	University of Idaho	12
W. Eric Wong	Professor, Department of Computer Science, Director of Advanced Research Center on Software Testing and Quality Assurance	University of Texas at Dallas	13
William Unger	Undergraduate Student, Department of Computer Science	Boise State University	15
Sarah Bradburn	Undergraduate Student, Department of Computer Science	Boise State University	16
Chad Hammerquist	PhD Candidate, Department of Wood Science and Engineering	Oregon State University	17
Anna Nelson	Graduate Student, Department of Mathematics	University of Utah	18
Vahab Bolvardi	PhD Student, Department of Civil Engineering	Colorado School of Mines	20
Ray DeLeon	PhD Candidate, Department of Mechanical Engineering	University of Idaho	22

June 23, 2015

Idaho State Board of Education
P.O. Box 83720
Boise, ID 83720-0037

RE: Letter in support of the BSU CS PhD in Computing

I am writing to express HP's strong support for the PhD program in Computing that is being proposed by the Computer Science Department at Boise State University.

As one of Boise's largest high-tech firms, and the largest single employer of software developers in the state of Idaho, it is vitally important to HP to have a large and sustained local pipeline of new, well-trained software engineering talent. For this reason, HP has worked to strengthen the Computer Science department at Boise State in order to assist the department in increasing the number of graduates, and to strengthen, promote, and support research and education programs within the Computer Science department that have significant value for HP, such as cyber-security, big data analytics, and cloud and mobile computing.

HP's interest in supporting the proposed PhD program in Computing is two-fold. First, HP recognizes that a robust and strong research program is required in order to attract and retain the highest quality faculty, and students. When one considers the top undergraduate computer science programs in the nation that graduate large numbers of high quality students, such programs all share the common trait that they have a PhD program and are nationally recognized for the quality of their research. Thus, a PhD program, properly implemented and prioritized, is a necessary ingredient for a large, robust, high quality undergraduate program.

Second, the proposed PhD program has three areas of emphasis that have value to HP – Computer Science, Cybersecurity, and Computational Science. Of particular interest is Cybersecurity, which HP has identified as a strategic and primary area of need. In addition to producing laptops, workstations, and tablet and other computational devices, HP is one of the largest manufacturers of printers in the World, and as printers have become more sophisticated they have increasingly become targets for hackers. It is estimated that the average cost to HP for each cybersecurity breach is at least 5 million dollars, and so it is clearly important for our bottom line (and reputation) that the software developers we hire understand security issues relative to software design in order to minimize such problems. We were happy to hear that the BSU CS department has recently implemented an undergraduate cybersecurity minor, and the graduate PhD program in cybersecurity will help to strengthen this program, and will allow the CS department to attract top researchers in this area.

Given these efforts, HP is very pleased to hear of the progress that has been made in the Computer Science department at Boise State University, much of which can be attributed to the first round of funding that they received 3 years ago through IGEM. This progress includes:

HP believes that the progress that has been made by the CS department at BSU in the last 3 years, doubling the number of graduates and the creation of courses and degree programs in cybersecurity, cloud computing, big data, and mobile computing, is astounding, and we want to do everything we can to support the momentum that they have created. We think that the continued success and growth of the CS department is vitally important for HP, and for a multitude of other companies in Idaho, and will have a significant, transformative economic impact on the Boise metro area and Idaho. For this reason we whole-heartedly support the PhD program in Computing at Boise State University.

Sincerely,

Jim Nottingham
Vice President and General Manager
LES Value HW and Technology
Hewlett Packard, Boise Idaho

STATE OF IDAHO
BUREAU OF HOMELAND SECURITY
4040 W. GUARD STREET, BLDG. 600
BOISE, IDAHO 83705-5004

C.L. "BUTCH" OTTER
GOVERNOR

Maj Gen GARY L. SAYLER
ADJUTANT GENERAL

BRAD RICHY

May 14, 2015

Dr. Dianxiang Xu
Professor and Graduate Coordinator
Department of Computer Science
Boise State University
Boise, ID 83725, USA

Dr. Xu,

It is with great pleasure, the Idaho Bureau of Homeland Security and I, fully and enthusiastically endorse the proposed Ph.D. program in Computing at Boise State University. The addition of this program will be of enormous benefit for not only Boise State and the Treasure Valley Region, but also the entire state of Idaho, the Pacific Northwest, and the nation.

Cyber security is a widespread problem that is challenging Idaho, the region, our nation, the military, businesses, government at all levels, and our society. New threats are constantly emerging with increased frequency, disastrous impact, and the potential of higher costs of doing business. There is a serious and immediate need for highly educated and experienced cyber security professionals. Idaho, and specifically the Boise region, with its numerous high technology businesses could see significant benefit from these future employees. We see the potential of numerous partnerships, between the school, businesses, and the government to further define the threat, and develop workable solutions. Idaho and the Pacific Northwest have a significant opportunity and the potential to advance cyber security degrees and interdisciplinary knowledge while addressing those cyber security issues and problems. To achieve the goals of this proposed Ph. D. program, a state-of-the-art knowledge across various disciplines - such as computer science, electrical engineering, mathematics, and other application domains - will be required. I believe Boise State is the perfect location.

The Idaho Bureau of Homeland Security is very pleased to see there is a proposed Ph.D. program being considered at Boise State University on cyber security issues. We hope that a rigorous and in depth cyber security curriculum will train a new generation of specialists to deal with the increasingly complex and dynamically changing cyber security problems and issues. I am confident that the Ph.D. program is a win for Boise State, and more importantly for Idaho education, research, business communities and government agencies. I fully support Boise State's proposal and their commitments to provide solutions to the educational and research challenges of Idaho and the nation.

Sincerely,

Brad Richy
Idaho Bureau of Homeland Security

Idaho National Laboratory **INL**

June 17, 2015   CCN 236016

Proposal Review Committee
c/o Tim Andersen, Ph.D.
Chair, Department of Computer Science
Boise State University
1910 University Drive
Boise, ID 83725

SUBJECT: Support for the development of a postdoctoral program for computer science,
             cybersecurity and computational science at Boise State University (BSU)

Dear Proposal Review Committee:

Idaho National Laboratory (INL) is pleased to support the proposal to develop graduate
programs for computer science, cybersecurity and computational science at Boise State
University. As one of the Department of Energy's ten multi-program laboratories and one of
Idaho's largest employers, INL strongly advocates programs that improve science, technology,
engineering, and math skills opportunities. The curriculum proposed for the graduate program is
of interest to both INL and industry.

Should this graduate program come to fruition, INL will support BSU in order to provide online
and hybrid course offerings that would accommodate participation by our personnel, advertise
and encourage INL employees to take the classes in future years, consider BSU students for
intern and postdoctoral assignments, and work on joint research projects.

There is a significant and growing need to address the challenges presented by an aging
workforce. Also noteworthy is the increasing skill levels required of individuals to be successful
in the various disciplines, including those proposed by BSU's graduate program, that support the
energy field. To meet the needs of the future energy workforce, it is vital that we increase the
number of students entering computer science, cybersecurity and computational science
programs.

INL has a long history with BSU and works closely with them on a variety of energy-related
activities, programs, and projects. Programs like the proposed graduate program help further our
goal of addressing INLs workforce needs. INL looks forward to participating on the proposed
efforts.

Sincerely,

Brent Stacey, Associate Laboratory Director
National & Homeland Security

MTB:LLR

Dr. Marion Scheepers
Department of Mathematics
Boise State University
Boise, ID 83725

Dear Dr. Scheepers,

It is my pleasure to write a letter in support of the creation of a minor in Cyber Security at Boise State University.

I lead the Information Risk and Cyber Security programs at Micron Technology. This gives me a very detailed understanding of global hacking techniques, motivations, and actors. I have also been partnering with Boise State University and the Idaho Science and Aerospace Scholars for speaking engagements to educate and motivate Idaho's high school students on STEM education topics.   I am also a graduate in Boise State's Executive MBA program.

It is clear that cyber threats continue to grow year over year as organized crime and government actors grow their cyber capabilities.   The motivation to continue to enhance cyber capabilities is immense, and it continues to have measureable business impact for Fortune 500 companies like Target, Home Depot, Sony Pictures, and Anthem.

While this situation is crossing over into the mainstream media and political arenas, the need to be able to protect the assets of our private sector and our country is quickly rising. A political solution will not happen fast enough to prevent the financial and intellectual property loss of our companies.   We need to improve our defense capabilities as a nation and, to do that, we need a steady supply of professionals that are educated and trained in cyber security topics.

The industry needs more people with awareness and training to deal with cyber risks. In the private sector, it is extremely difficult to find and hire an experienced security engineer.   In the area of Boise, Idaho where Micron is headquartered, it is almost impossible.   I fully support the creation of a Ph.D. degree program for Computing with an emphasis on Cyber Security.   Any program that better prepares individuals in the Treasure Valley, and the nation, to defend against cyber threats will benefit our community and ensure our global competitiveness into the future.

Sincerely,

J.R. Tietsort
Chief Information Security Officer
Micron Technology, Inc.

Kount® CERTAINTY AHEAD ➤

June 8, 2015

Dr. Marion Scheepers
Department of Mathematics
Boise State University
Boise, ID 83725

Dear Dr. Scheepers

I am writing to express my support for the proposed cyber security Ph.D. program at Boise State University. My company, Kount, protects companies from fraud, risk and loss in the online world. As such, we see the tremendous need for new and innovative solutions in the field of cyber security on a daily basis.

Industry will require dramatic increase in people that are highly skilled and trained in the cyber security. This need will continue into the foreseeable future. These people will protect critical cyber resources from growing threats. Those threats are becoming apparent as they are now appearing in headlines on a daily basis. A doctoral program at Boise State will produce people that would be viewed as a local, national, and global treasure.

I applaud the efforts of Boise State to meet the growing resource needs in cyber security.

Rich Stuppy
Chief Operating Officer, Kount, Inc.

www.kount.com

917 s. lusk street | boise, idaho 83706

State of Idaho

DEPARTMENT OF WATER RESOURCES

322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098
Phone: (208) 287-4800 • Fax: (208) 287-6700 • Website: www.idwr.idaho.gov

C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

May 20, 2015

Jodi Mead, Professor and Graduate Coordinator
Department of Mathematics
Boise State University
Mathematics Building 140A
Boise, ID 83725-1555

Dear Dr. Mead:

I am writing this letter in support of your proposal to establish a PhD program in Computing with emphasis in Computational Science and Engineering (CSE) at Boise State University. There is no doubt in my mind that the program will produce readily employable PhD graduates that will contribute to the development and improvement of computational tools that increasingly are relied upon by industry and government to help solve real-world problems, such as those faced by water managers here in Idaho.

At Idaho Department of Water Resources, we develop and apply computer models of aquifer systems to support conjunctive management of our surface and groundwater resources. Our aquifer models are developed using the U.S. Geological Survey computer program MODFLOW and calibrated using Parallel PEST, a state-of-the-art parameter estimation and uncertainty analysis software program that's been developed to take advantage of the computational efficiencies of parallel computing. Because of our reliance on these software programs, I can attest firsthand to the value of including numerical methods and parallel computing in the proposed curriculum.

In my experience, the best modelers are scientists and engineers with strong mathematical and programming skills. As such, graduates through the interdisciplinary PhD program will be uniquely qualified, not only to develop advanced modeling tools, but also to participate in model development and model application at my agency and elsewhere in the United States and abroad.

In conclusion, I want to reiterate my strong support for the development of a PhD program in Computing with emphasis in Computational Science and Engineering at Boise State University. As a former groundwater modeler who now hires and manages a group of scientists and engineers, I am confident that the program will provide students with the practical skills and theoretical underpinnings necessary to prepare them for a variety of exciting opportunities in industry and government.

Sincerely,

Sean Vincent, P.G.
Hydrology Section Manager

Andrew E. Slaughter
Idaho National Laboratory
P.O. Box 1625
Idaho Falls, ID 83415

May 27, 2015

Inanc Senocak, Ph.D.
Department of Mechanical & Biomedical Engineering
Boise State University
1910 University Drive, MS-2085
Boise, ID 83725-2085

Dear Prof. Senocak,

I am pleased to support the creation of a PhD in Computing, Computational Science and Engineering (CSE) emphasis at Boise State University (BSU). As a modeling and simulation researcher and software developer at Idaho National Laboratory (INL) I understand that the demand for competent scientists capable of grasping key engineering concepts as well as developing quality software is of critical importance to the continued success of INL.

A key aspect of the new program at BSU is the focus on the "integration and application of principles from mathematics, science, engineering and computing to create computational models for solving important real-world problems." As a developer of the Multiphysics Object Oriented Simulation Environment (MOOSE), INL's flagship simulation platform, this is precisely the mindset and background required for employment and collaboration with the modeling and simulation department at INL. The existence of a program at BSU that aims to develop students in this capacity is in harmony with INL's ongoing efforts, and will be a major contributor to our future workforce and collaborative opportunities.

Please let me know if you need any additional information or support as you finalize the creation of the doctoral program. Additionally, I would welcome the opportunity to be a part of the program in some capacity to help foster the relationship with BSU and INL.

Sincerely,

Andrew E. Slaughter, PhD
andrew.slaughter@inl.gov
208.526.6888

Jodi Mead
Professor and Graduate Coordinator
Department of Mathematics
Boise State University
Mathematics Building 140A
Boise, ID 83725-1555

May 18, 2014

Dear Professor Mead,

I am writing this letter to express my strong support for the proposed Ph.D. program in Computing with an emphasis in Computational Science and Engineering to be housed in the Computer Science department at Boise State University (BSU).

It was a great pleasure to have you visit us and be a speaker at our mathematics colloquium at the University of Idaho (UI) during Spring 2012. I have equally enjoyed our interactions during my visit to BSU during Fall 2012 for the Pacific Northwest Numerical Analysis Seminar where I had the honor of giving a talk. I am aware that you have also visited and given talks at the mathematics department in Washington State University (WSU), Pullman, WA. It seems that having a program such as the one proposed would give further opportunities for collaborations between your group at BSU and other regional institutions including UI and WSU. This would lead to greater activity among local researchers in applied and computational mathematics in both academia and industry.

Currently, our department at UI, Moscow, is the only department in the state of Idaho that offers a Ph.D. degree in mathematics. Since BSU currently does not have a Ph.D. program in mathematics I am very enthusiastic in my support of this proposed program since it will not only give some faculty members in mathematics like yourself an opportunity to supervise Ph.D. students (at BSU), but also students from the region interested in applied and computational mathematics will have a wonderful chance of pursuing research. Given that the mathematics department at UI is focused more on pure and abstract mathematics, this program would bring in a different dimension to the kind of student research being done in the state of Idaho.
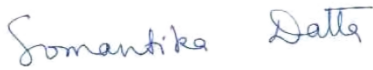
On a more personal note, my research involves developing and studying mathematical techniques that can be applied to signal and image processing. Since one of the goals of the proposed program is to increase the capacity for solving complex interdisciplinary

computing problems in the areas of computational science and engineering, if a student's project were to suitably align with my own, I would be highly interested in participating either as a member of a course supervisory committee or in some other form.

If there is anything else I can do to help in your petition for this case, please do not hesitate to contact me.

Sincerely,

Somantika Datta

Somantika Datta
Assistant Professor
Department of Mathematics
University of Idaho
875 Perimeter Drive MS 1103
Moscow, ID 83844-1103

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University of Idaho
College of Science

Department of Mathematics
PO Box 441103
Moscow, Idaho 83844-1103

Phone: 208-885-6742
Fax: 208-885-5843
math@uidaho.edu
www.uidaho.edu/math

May 20, 2015

Jodi Mead
Professor and Graduate Coordinator
Department of Mathematics
Boise State University
Mathematics Building 140A
Boise, ID 83725-1555

Dear Professor Mead,

I am very excited to support your goal of creating a new PhD program in Computational Science and Engineering (CSE) in the Computer Science Department at Boise State University. As an applied mathematician at the Department of Mathematics at the University of Idaho, I feel that this program will be very useful for current and prospective students as well as faculty at Boise State University.

Students will be able to develop skills necessary for solving complex interdisciplinary problems in the areas of computational science and engineering, computer science and cyber security. They will become more prepared to work for high-tech companies in the state and outside, national laboratories and other institutions.

This program will also increase opportunities for Boise State University faculty to collaborate with faculty from other Idaho institutions including the University of Idaho. In fact, you and I already had some opportunities to visit each other several times and work together on inverse methods and regularization. I hope to continue this collaboration in the future. Furthermore, if my areas of research are useful, I would be interested in co-advising or serving on graduate committees. I am currently an affiliated faculty at the Department of Electrical and Computer Engineering and have been working with graduate students from that department in the area of Microelectronics on projects that are of interest to the microelectronic company Micron Technology located in Boise. I find this interdisciplinary research very interesting and rewarding.

Please let me know if I can provide additional support as you prepare your case for a doctoral program in Computational Science and Engineering.

Sincerely,

Lyudmyla L. Barannyk

Assistant Professor
Department of Mathematics
875 Perimeter Drive MS 1103
Moscow, ID 83844-1103
Tel: (208) 885-6719; Fax: (208) 885-5843
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U T D

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(972) 883-2808   FAX: (972) 883-2349

Department of Computer Science

Dr. Tim Andersen
Professor and Chair
Department of Computer Science
Boise State University
Boise, ID 83725, USA

May 15, 2015

Re: Support letter for a Ph.D. program in Computing

Dear Dr. Andersen,

It is my great pleasure to write this letter of support for the proposed Ph.D. program in Computing at Boise State University.

I am a full professor and the director of the Advanced Research Center on Software Testing and Quality Assurance (http://paris.utdallas.edu/stqa) in the Department of Computer Science at the University of Texas at Dallas. I am also the Vice President of the IEEE Reliability Society. My research focuses on helping practitioners improve the quality of software while reducing the cost of production. In particular, I am working on software testing, debugging, risk analysis/metrics, safety, and reliability. More information about my publications, ongoing projects, and research funding can be found at http://www.utdallas.edu/~ewong.

I have been collaborating with Dr. Dianxiang Xu since 2005 when he was an assistant professor at North Dakota State University. Before Dr. Xu joined your department as a professor in 2013, we had worked on several projects together, one of which was funded by NASA. These projects resulted in eight joint publications, including five journal articles and three conference papers.

After Dr. Xu joined Boise State, we continued to seek opportunities for collaboration. Our joint work in the past two years, however, has produced no publications or grant proposals. A major reason for this has been the lack of doctoral students in Dr. Xu's group at Boise State. Our projects at North Dakota State University had involved two Ph.D. students, who are now tenured/tenure-track faculty. In my opinion, there are two major differences between doctoral students and master's students. First, doctoral students tend to have stronger motivation, which is essential for high research productivity. Second, doctoral students usually make longer-term commitments to research projects. Master's students, on the other hand, are often close to the completion of their studies after they have finished the training required for their research projects. As such, a Ph.D. program is imperative for building and sustaining a high-quality research program. I am very enthusiastic about the proposed Ph.D. program in your department.

There is no doubt that the proposed Ph.D. program will strengthen my current collaboration with Dr. Xu. More importantly, it will enable many faculty members at Boise State University to collaborate with faculty across departments and colleges as well as from other universities. This

will significantly promote Boise State's research and education programs and result in significant contributions to the local, regional, and even national communities.

Sincerely,

W. Eric Wong
Professor &
Director of Advanced Research Center on Software Testing and Quality Assurance
Department of Computer Science
University of Texas at Dalas

May 14, 2015

Dr Dianxiang Xu
Graduate Coordinator
Dept. of Computer Science
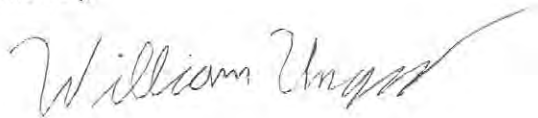Boise State University
Boise, ID 83725

Dear Dr. Xu

As an undergraduate student in both Computer Science and Mathematics, I would like to offer my support for the creation of a PhD program in Computing at Boise State University. I am interested in pursuing an advanced education degree in Computing with a focus in cyber security. Having a PhD program in Computing at Boise State University will allow myself and other talented undergraduates the opportunity to continue our education at Boise State and will attract other talented and qualified students to both undergraduate and graduate programs. Having this graduate program is critical in the development/growth of the Computer Science program and will springboard our university to a higher academic level nationally.

Cyber security has become a national issue with security breaches reported in daily news reports. There will be a continued demand for highly trained computer scientists with this specialized skill in the job market. Boise State has started to address this by introducing a minor in cyber security, but the development of the PhD program would enhance research in this area and provide highly trained professionals who are prepared for a leadership role in this field.

I am looking forward to the opportunity to pursue my education at Boise State University.

Sincerely,

William Unger
Undergraduate Student
Boise State University
Dept. of Computer Science
Dept. of Mathematics
williamunger@u.boisestate.edu

June 1, 2015

Dianxiang Xu, Ph.D
Professor, Graduate Coordinator
Department of Computer Science
1910 University Drive
Boise State University
Boise, ID 83725-2075

Dear Dr. Xu,

I am a senior in the computer science department at Boise State, and I am writing to show my support for the proposed creation of PhD program in Computer Science.

I started my college career as a biology major, and during that time I worked in a phylogenetics lab. When I changed majors my hope was to continue to do research as a computer scientist. I am currently a research assistant working on computational biochemistry software, and I would like to continue working on this project after I graduate while studying in the proposed PhD program.

For the past year I have also been part of the IDoCode project, which has the aim of getting computer science courses into high schools. My job has involved tutoring for people in the masters in STEM education program and helping run workshops for high school students and teachers. Tutoring has been one of my favorite things about being a student, and it has made me realize that I would like for teaching at the university level to continue to be part of my life.

In the past, I thought my goal of becoming a professor would force me to leave Boise. My education at Boise State has been stellar, and Boise is a great place to live. A PhD program here would attract students to our school and allow current students to improve the Boise tech community instead of going elsewhere. I strongly support the proposed Computer Science PhD program as a great opportunity for computer science students.

I am excited about the possibility of continuing my education at Boise State.

Sincerely,

Sarah Bradburn

Sarah Bradburn

To Whom it May Concern,

I am eager to add my support for the new CSE PhD program and the collaboration with the Math Department.

During my time at BSU, I worked under Jodi Mead as a research assistant working on a research grant while I was pursuing a Masters in Mathematics at Boise State. We developed a method for regularization using non-linear inverse methods. I enjoyed my experience in the Boise State Graduate Math program. The classes were very challenging and diverse. The class sizes were small which allowed for more one-on-one interaction with the professors. They were accessible and were instrumental at preparing me for a career in the Mathematics field after BSU.

Jodi Mead was an excellent advisor and collaborator. She was very understanding and patient and trusted me with many responsibilities as her research assistant. Her interdisciplinary connections with both the engineering and geoscience departments allowed me to get a broader educational experience than I would have otherwise. Also, due to her research, I was given the opportunity to attend and present at two major conferences during my time at BSU. At the DTRA/NSF conference in Boston I presented a poster describing the method Jodi and I developed. The next year, I got the opportunity to present our method at the SIAM Uncertainty Quantification conference in North Carolina. Both opportunities allowed me to grow as a researcher and a presenter. I was also able to make valuable connections with others in my field of study.

After receiving my Master's degree from BSU, I decided to pursue a career in Mathematics. Through a connection at Scentsy, Inc. I was able to start working as a Financial Statistician. I developed a statistical sales forecasting model using time series modeling and inverse methods. This model was used to project sales annually, monthly, and daily. Those projections were then used to order products and raw materials. Also, I used mathematic optimization to develop better business practices for the company.

I have always had the dream of getting my PhD and had this new program existed at BSU I definitely would have considered this program, especially considering my undergraduate degree in Engineering and my masters in Mathematics.

I did however have an opportunity come up at Oregon State University, and so I am currently pursuing a joint PhD at OSU in Mechanical Engineering and Wood Science. For my research assistantship, we are developing a wood adhesive. My responsibility is to model the wood adhesive interfaces at the cellular level and combine the results with experimental data, using inverse methods and mechanical material modeling. My education and interdisciplinary experience at Boise State was very valuable in preparing me for both my job at Scentsy and my research at Oregon State. And I am excited about the possibility of the new CSE program and its collaboration with the Math Department.

Sincerely,

Chad Hammerquist, BS,BS,MS

University of Utah
Department of Mathematics
155 S 1400 E Room 233
Salt Lake City, UT 84112

May 22, 2015

To the Idaho State Board of Education:

My name is Anna Nelson, a graduate student at University of Utah in mathematics, and I am writing this letter in support of the proposed PhD in Computing, with emphasis in Computational Science and Engineering (CSE) at my alma mater, Boise State University. Growing up in Idaho, I received a strong education from Idaho public schools, attending middle school and high school in the state. In three and a half years, I graduated from Boise State summa cum laude with a degree in Applied Mathematics and a minor in Computer Science. During my time at Boise State, I was active in the undergraduate academic community both locally and nationally. I was able to attend national meetings in the mathematical community, as well attend many local conferences in the state of Idaho, such as the first Idaho Conference for Undergraduate Research.

I have since continued with my studies by attending graduate school for the past two years, focusing on applications in the biological sciences. In fall 2013, I was accepted to the PhD program in Biomathematics at North Carolina State University, which is an interdisciplinary program aimed at students who want training in both biology and mathematics. After a year of taking statistics and math classes at NC State, I transferred to the PhD program in Mathematics at University of Utah, with a specific emphasis in mathematical biology. After completing my degree, my professional goal is to work in an industry field that uses mathematical and computational techniques to answer important questions in biology.

Scientific computation is an invaluable tool that allows researchers to study complex and large-scale problems that would be impossible to study with direct experimentation. Computational Science and Engineering involves the integration and development of knowledge from three fields: applied mathematics, computer science, and engineering/science. With suitable background in a specific field of science or engineering, students have the expertise to collaborate with scientists, understand the important questions in the field, and have the ability to communicate their computational results in an effective manner. Using tools and methodologies from mathematics and computer science, students in CSE are in every step of the problem-solving process in science, from development to analyzing computational results.

The proposed PhD in Computing, with emphasis in CSE, would put Boise State and its students on the forefront of the rapidly-growing field of computation. With a CSE education, graduate students would have a toolset that is well rounded and have the ability to problem-solve in almost any scientific field or discipline, as opposed to only having the ability to program. Students matriculating through the CSE PhD in Computing program would be prepared

to go for any computational job in government, industry or academia, in the state of Idaho or across the country. With expertise in computational methodologies, students will be able to simulate data for design, manufacturing, and decision-making, in fields such as weather/climate prediction and financial forecasting. CSE graduate students at Boise State would also be able to develop models and analyze experimental data in fields such as medicine, chemistry and bioengineering.

With this advance degree, Boise State University would offer an nationally competitive option to undergraduate students who wish to continue their education in Boise, Idaho, where they would have the opportunity to be involved in an exciting multidisciplinary environment that can properly train them for their careers. After completing their career, students would be candidates for Idaho government and industry jobs, such as the Idaho National Lab, Clearwater Analytics, and J.R. Simplot Company. Students will be prepared to take part in all aspects of research in industry and have the ability to communicate across disciplines their methodologies and approaches. In addition to Idaho jobs, students would also be competitive on a national level and could apply to jobs in other national labs, biomedical research labs, and in academia as well.

As a Boise State graduate that was looking to advance my education, the PhD in Computing with emphasis in CSE would have been a great option for me to further my knowledge and skill set in computation, as well as gain expertise in an interdisciplinary field. With this degree, I would be a strong candidate for jobs that require not only a computational and computer science background, but also require critical thinking, problem solving, and a thorough background knowledge in that specific science.The CSE PhD program will foster collaboration across disciplines and departments that will benefit all parties involved, including Boise State and industries in Idaho as well as around the country. To have a PhD program at Boise State University will only bolster its quality research status and put Boise State on the forefront of computational interdisciplinary research, which is why with unhesitating enthusiasm I support this proposed program.

Sincerely,

Anna Nelson
anelson@math.utah.edu

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To whom it may concern,

I, Vahab Bolvardi, received an M.S. degree from the Civil Engineering program at Boise State University. At Boise State, I conducted research that required computational knowledge. I would have preferred to stay at Boise State if the proposed Ph.D. in Computational Science & Engineering Existed. However, it did not exist, and I had to leave Boise to pursue my PhD in Colorado School of Mines.

Nowadays, most of people use modern technology to do their routine and/or specific tasks and responsibilities. This kind of powerful and user-friendly technology is a product of interconnection and attempts of different majors like computer science and engineering with electrical, mechanical, and civil engineering. As a former Masters student at the Civil Engineering Department of Boise State University who was involved in both numerical and experimental studies, I would have benefitted from the proposed attempt to develop a Ph.D. program in Computational Science & Engineering and Cybersecurity at Boise State University.

Since I have been performing numerical study in both my Masters and Ph.D. research work, I needed to learn to develop multiscale multiphysics numerical models according to the requirements of my proposed multidisciplinary research work. During my years at Boise State University, I took courses such as computational Techniques (CE 502) in Geotechnical Engineering from the Civil Engineering Department, Finite Element Method (ME 470) from the Mechanical & Biomedical Department, and Applied Electromagnetics (ECE 500) from the Electrical Engineering to be able to study my research topic that required a coupled study of electromagnetic waves and multiphase flow. Hence, I believe a new Ph.D. program in Computational Science & Engineering would be much more advantageous and useful for the multidisciplinary research of today. In addition, this upcoming development of a new Ph.D. program in above areas at Boise State University will increase collaborations with other disciplines especially in engineering majors and across Boise State University and universities such as Colorado School of Mines where I am doing my Ph.D.

Ph.D. Graduates of such program would be able to study much more complex problems and address them in more useful and practical ways. These future graduates will also own valuable and rare expertise that are becoming more and more necessary in today's transdisciplinary research.

On the other hands, offering such a unique Ph.D. program in this extremely interdisciplinary area at Boise State University would be attractive and provide better opportunities for the students who graduate from various science and engineering Masters programs from other school looking for a Ph.D. position like a year ago myself. Not only is this chance helpful for those students but it may also encourage students in other disciplines to pursue their Ph.D. in such area, which provides essential knowledge applicable across various majors. Such Masters students always look for academic area, facilities, and professional research groups, which could help them and

their advising committees to achieve their professional goals faster and at a higher quality. Being familiar with a few universities I attended for my graduate studies, I believe there is a large population of M.S. students who would be potential applicants for the proposed Ph.D. program at Boise State University.

Sincerely,

V.Bolvardi

Vahab Bolvardi
Ph.D. Student
Colorado School of Mines
vbolvard@mines.edu

May 22, 2015

Inanc Senocak, PhD
Department of Mechanical & Biomedical Engineering
College of Engineering
Boise State University
1910 University Dr.
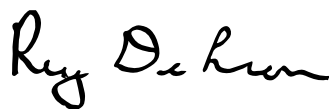Boise, ID 83725-2085

Dear Dr. Senocak:

I strongly support the addition of the proposed PhD in Computing: Computational Science and Engineering (CSE) emphasis. As a current PhD student who transferred from Boise State to the University of Idaho after completion of an MS degree, I would have strongly considered the option of enrolling in a PhD program at BSU, had the option related to my field of study existed at the time. Upon completion of my MS degree, I desired to pursue a PhD and continue the line of research in computational science I had started during my MS. As I also wished to stay in Boise while pursuing a PhD, my best option was to enroll in the Mechanical Engineering program at UI. Now, my current situation is completing my coursework through UI Boise and performing my research at BSU.

My doctoral research is currently in an area of computational science known as computational fluid dynamics or CFD. My CFD research involves the coupling of physical principles that govern fluid flow with high-performance computing platforms. The proposed curriculum for the PhD in Computing would have fit perfectly with my line of research. Had such a program existed, I would have strongly considered pursuing a PhD at BSU.

Through my experience, I have seen the need for such a program. Problems seen today are becoming more and more interdisciplinary and complex. The only practical way to address these complex problems is through computation and simulation. This means those with PhD-level skills in computational science and engineering are going to be in high demand and that demand will continue to grow as problems continue to increase in complexity. As BSU would be the first in the state to have such a program, collaborations with other Idaho institutions would increase and would provide the state of Idaho more PhD graduates in a high-tech field. I strongly believe that as Boise State continues to grow and evolve, having a PhD in such a high-demand and high-tech area would increase academic recognition and prestige.

Sincerely,

Rey DeLeon
PhD Candidate
University of Idaho Boise
322 E. Front Street, Ste. 242
Boise, ID 83702

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BOISE STATE UNIVERSITY

SUBJECT
Online, Bachelor of Applied Science Program

APPLICABLE STATUTE, RULE, OR POLICY
Idaho State Board of Education Governing Policies & Procedures, Section III.G and Section V.R.

BACKGROUND/DISCUSSION
Boise State University (BSU) proposes to create an online option for its existing, degree-completion program that awards a Bachelor of Applied Science (BAS) degree. Students will enter the program with a technical associate's degree (e.g., an Associate of Applied Science [AAS]), and will graduate with an academic baccalaureate degree that builds on the foundation of the technical associate's degree.

The BAS is an industry-recognized degree that gives graduates the opportunity to realize their professional goals. BAS graduates are well-rounded, experienced, and have both the technical skills and practical-minded communication skills to be valuable members of Idaho's labor pool. The BAS program helps students bridge the gaps between craft and management, and provides a baccalaureate degree, which has become a common prerequisite for management-level positions in nearly every industry.

Because many AAS graduates work full-time, it is important to provide a program that has flexible course schedules and alternative meeting formats. BSU has found that 75% of the students in its existing BAS program work full-time, and would therefore likely benefit from an online program that offers more flexibility. In addition, an online program will provide access for students not within commuting distance of a face-to-face program. For example, 393 students graduated in 2014-15 from College of Southern Idaho, Eastern Idaho Technical College, and North Idaho College with an AAS but have no face-to-face option for pursuing a BAS. Finally, the online pathway is an excellent option for students in the military, especially for students who have completed an AAS from the Community College of the Air Force (CCAF). Students will be able to transfer to Boise State and finish their BAS degrees without challenges associated with deployment or relocation.

No other institution in Idaho offers a fully online BAS program.

Graduates from a BAS program work in a wide variety of fields; therefore, labor data can only provide the roughest of estimates of workforce need. Department of Labor data regarding the job group "Operations Specialties Managers" provides a rough estimate, and indicates that there are estimated at 249

openings per year in Boise State's service area and 498 per year in Idaho. Nationally, job openings in this field are estimated at 49,990 per year.

IMPACT

The program will operate under the guidelines of Board Policy V.R as they pertain to wholly online programs. This policy enables the institution to set a price-point appropriate for the program; students will pay an online program fee in lieu of tuition. The price-point for the proposed online program fee will be as follows: BSU will charge the same rate as the per-credit rate for tuition and fees that is charged to resident students with the additional charge of $30 per credit which matches what BSU charges per credit for online courses. BSU will automatically increase the fee in any years that the State Board of Education increases Boise State's per-credit rate for tuition and fees, and would decrease the fee should the per-credit rate for tuition and fees be decreased.

The total cost to the student to complete the program will vary with the number of credits that the student will need to successfully complete. At a minimum, students entering the program will need to take 40 credits in the program. Students entering with no additional credits beyond an AAS degree will need to take an additional 24-25 credits beyond the 40 credit minimum. The cost to the student of 25 additional credits would be $8,175. The per-credit cost for the online program fee in this example is calculated as equivalent to the recently approved FY2017 tuition and fees rate of $297 per credit plus the online course fee of $30 per credit.

The program will not require the use of any new state appropriated funds.

ATTACHMENTS

Attachment 1 – Bachelor of Applied Science Program Proposal   Page 5

STAFF COMMENTS AND RECOMMENDATIONS

Boise State University (BSU) proposes the creation of an online, degree-completion program that will award a Bachelor of Applied Science. BSU's proposed BAS degree is not a technical degree. Students will graduate with an academic baccalaureate degree that builds on the foundation of technical associate's degree. The proposed program will serve students who possess an AAS degree and who could benefit from a baccalaureate level education.

BSU's request to create an online Bachelor of Applied Science is consistent with their Service Region Program Responsibilities and is included in their Five-year Plan update to be considered by the Board at the August 2016 Board meeting. Consistent with Board Policy III.Z, no institution has the statewide program responsibility for a BAS program. Additionally, Board Policy III.Z does not apply to programs for which 90% or more of all activity is required or completed online. The following represents other BAS programs offered by institutions:

Institution	Program Title	CIP Code	Degree Level/ Certificate	Location(s)	Regional/ Statewide	Method of Delivery
LCSC	Bachelor of Applied Science	24.0102	BAS	Lewiston	Regional	Traditional
ISU	Bachelor of Applied Science	24.0101	BAS	Pocatello	Regional	Traditional
BSU	Bachelor of Applied Science	30.9999	BAS	Boise	Regional	Traditional

BSU also requests approval to assess an online program fee consistent with Board Policy V.R.3.a.(x). Based on the information for the online program fee provided in the proposal, staff finds that the criteria have been met for this program.

The proposal went through the program review process and was recommended for approval by the Council on Academic Affairs and Programs (CAAP) on May 26, 2016. The Instruction, Research, and Student Affairs (IRSA) committee also recommended approval at their June 2, 2016 meeting.

Staff believes that there is sufficient justification, based on regional need, for BSU to create the proposed program.

BOARD ACTION

I move to approve the request by Boise State University to create an online option for their existing, degree-completion program that will award an online Bachelor of Applied Science in substantial conformance with the program proposal provided as Attachment 1.

Moved by _____ Seconded by _____ Carried Yes _____ No _____

I move to approve the request by Boise State University to designate an online program fee for the Bachelor of Applied Science of $297 per credit.

Moved by _____ Seconded by _____ Carried Yes _____ No _____

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Idaho State Board of Education
Proposal for **Undergraduate/Graduate Degree** Program
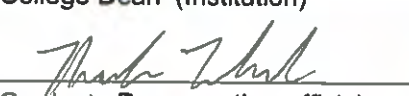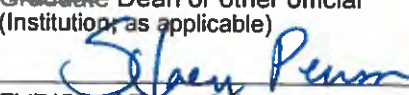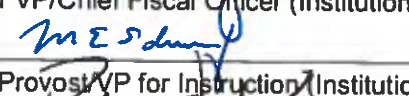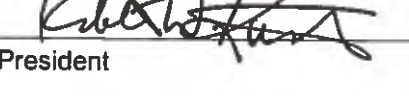
Date of Proposal Submission:	
Institution Submitting Proposal:	Boise State University
Name of College, School, or Division:	College of Arts and Sciences
Name of Department(s) or Area(s):	Bachelor of Applied Science

Program Identification for Proposed New or Modified Program:

Program Title:	Bachelor of Applied Science				
Degree:		Degree Designation	**X** Undergraduate		Graduate
Indicate if Online Program:	**X** Yes (Using Online Fee Model)		No		
CIP code (consult IR /Registrar):	30.9999				
Proposed Starting Date:	Fall 2016				
Geographical Delivery:	Location(s)		Region(s)		
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:

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

[signature]			
College Dean (Institution)	4/6/16 Date	Vice President for Research (Institution; as applicable)	Date
[signature]			
Graduate Dean or other official (Institution, as applicable)	4/6/16 Date	Academic Affairs Program Manager, OSBE	Date
[signature]			
FVP/Chief Fiscal Officer (Institution)	4/15/16 Date	Chief Academic Officer, OSBE	Date
[signature]			
Provost/VP for Instruction (Institution)	4/7/16 Date	SBOE/Executive Director Approval	Date
[signature]			
President	4/18/16 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. <u>All questions must be answered</u>.

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.

    The Bachelor of Applied Science Program (BAS) at Boise State University proposes the creation of a completely online bachelor's degree program for students who have completed technical associate degrees (i.e., Associate of Applied Science [AAS]). The new online BAS program will operate under the guidelines of the newly revised SBOE Policy V.R as they pertain to wholly online programs, and it will make use of a specific set of 14 upper division courses worth 40 credits that are offered online (see Appendix A).

    The proposed, wholly-online program will operate in parallel with the existing, traditionally-funded BAS program. The existing BAS program will continue to make use of a broad array of in-person, hybrid, and online courses, and will therefore continue to offer each student in the existing BAS program the opportunity to create an individualized emphasis. As Boise State continues to expand offerings of online upper division courses, we will be able to provide additional opportunities for diversity of coursework in the wholly online program.

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.

    Students who enroll in technical associate degree programs typically have two-year educational aspirations. They are eager to learn a skill and use that skill to start a new career. However, their educational aspirations often increase a few years after entering the workforce, usually in tandem with changes in their professional and career goals. A bachelor's degree has become a common prerequisite for management-level positions in nearly every industry. The proposed program will provide students with a degree program that acknowledges and accepts their previous educational work, that helps them transition into a demanding academic environment, that gradually and deliberately bridges the theory-practice divide, and that prepares them for leadership roles in their fields. But they also need a degree that has flexible course schedules and alternative meeting formats.

    A majority of BAS students at Boise State work full-time. A survey administered during the Fall 2015 semester revealed that over 75% of our current BAS student population works full-time. Boise State's existing BAS program has made substantial progress accommodating working students by offering meaningful emphasis areas that can be completed by taking evening, weekend, and hybrid classes. This flexibility has had a substantial impact on the lives of our students, and it has enabled hundreds of them to graduate with a BAS, which, ultimately, has led to a more competent, skilled, and credentialed workforce in the Treasure Valley.

    However, although we can accommodate many potential students, there are many others for whom our offerings are not flexible enough. Many technical graduates move directly into positions that have long or odd hours, rotating shifts, or periods of extended travel. Many have familial responsibilities that prevent them from consistently being able to devote their evenings or weekends even to irregular or reduced meeting schedules. A wholly online program will provide this flexibility.

An online program will also enable us to reach potential students that live in communities that do not have access to in-person baccalaureate programs. For example, during the 2014-15 academic year, 393 students graduated with an AAS from the College of Southern Idaho, Eastern Idaho Technical College, and North Idaho College, each in a community without a face-to-face option for a BAS. The online BAS will give hundreds of previous and future place-bound AAS graduates throughout Idaho the opportunity to finish four-year degrees.

The creation of an online BAS program will broaden the set of students who can advance professionally. The program will also enable local companies to confidently invest in the professional and educational development of their staffs, promote internally, and retain their most promising and skilled employees.

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. Operations Specialties Managers; SOC 11-3000

	State DOL data	Federal DOL data	Other data source: (describe)
Local (Service Area)	249	N/A	N/A
State	498	N/A	N/A
Nation	N/A	49,990	N/A

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

Graduates from a BAS program work in a wide variety of fields; therefore, labor data can only provide the roughest of estimates of workforce need. And to provide that rough estimate, we use numbers from the job group Operations Specialties Managers (SOC 11-3000).

2014 National Employment Matrix title and code		Employment (1000's)		Job openings due to growth and replacement needs, 2014-24 (1000's)
		2014	2024	
Operations specialties managers	11-3000	1,721.9	1,847.7	499.9

2012-22 Idaho Long Term Employment Projections		Base Employment and Projected Employment		Total Annual Openings
		2012	2022	
Operations specialties managers	11-3000	1,721.9	1,847.7	498

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.**

One of the four universities studied for a recent research brief prepared by the Education Advisory Board reported that, even though the university "offers a BAS degree both online and face-to-face, over 75 percent of students chose to complete the program online."[1]

The Bachelor of Applied Science Program (BAS) used a number of methods to determine the potential student interest in the proposed program.

1. The Director met with the Professional-Technical Education deans at the College of Western Idaho, the College of Southern Idaho, and Treasure Valley Community College to discuss the proposal and potential numbers of direct and indirect (students returning to college after 2-5 years in the workforce) transfers from their AAS programs. The initial expectation for direct transfers was around 12%, but all three institutions indicated that an aggressive awareness campaign could quickly drive that number closer to 20%. Indirect transfers will be marketed to differently, but are expected to match the number of direct transfers during the first two years. By the third year, a stronger connection to and relationship with Idaho's community colleges, including North Idaho College and Eastern Idaho Technical College should increase AAS students' in-program awareness of Boise State's online BAS and drive the indirect transfer numbers up substantially.

2. There are typically over 700 new AAS graduates every year in Idaho and several thousand more in neighboring states. Every AAS graduate is a prospective BAS student. Other Western states have recently emphasized the need to create more pathways to 4-year degrees for their technical graduates. The demand for BAS programs has grown, but there are still very few of them, and even fewer that can be completed entirely online.

3. This online pathway is also an excellent option for students in the military, especially for students who have completed an AAS from the Community College of the Air Force. It allows these students to transfer to Boise State and finish their BASs without having to worry about deployment or relocation issues.

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

The BAS is an industry recognized degree that gives our graduates the opportunity to realize their professional goals. BAS graduates apply for higher-level positions, graduate certificate programs, master's degree programs, and professional programs. BAS graduates are well-rounded, experienced, and have both the technical skills and practical-minded communication skills to be valuable members of Idaho's labor pool. The BAS program helps students bridge the gaps between craft and management and turns today's technicians into tomorrow's leaders and professional managers.

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

   N/A

   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.

1 Hurley, J., and J. Tannous, "Bachelor's of Applied Science Degrees: Program Overview, Curricula, and Demand," The Advisory Board Company, 2013.

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**
BSU	BAS	Individualized specializations
CSI	AAS	37 AAS specializations
CWI	AAS	31 AAS specializations
EITC	AAS	11 AAS specializations
ISU	AAS/BAS	30 AAS specializations
LCSC	AAS/BAS/BAT	25 AAS specializations
NIC	AAS	23 AAS specializations

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**
Oregon Institute of Technology	BAS	Bachelor of Applied Science in Technology and Management (Online)
Arizona State University	BAS	Bachelor of Applied Science in Operations Management (Online) Bachelor of Applied Science in Internet and Web Development (Online) Bachelor of Applied Science in Health Sciences (Online)

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.

    Idaho State University and Lewis Clark State College both have Bachelor of Applied Science or Bachelor of Applied Technology programs, but neither institution has a completely online program. There are no comparable programs in Idaho and few in the Pacific Northwest.

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

Goals of Institution Strategic Plan	Proposed Program Plans to Achieve the Goal
Goal 1: Create a signature, high-quality educational experience for all students	Boise State's online program development process allowed us to create a cohesive, consistent, rigorous, and outcome-driven educational experience. The proposed program helps students bridge the gaps between theory and practice.
Goal 2: Facilitate the timely attainment of educational goals of our diverse student population	The online delivery of this program will enable students with work, life, or other adult responsibilities to complete their degree requirements in as few as 18 months. Our BAS courses and intrusive advising model has led to very high student success (94%) and satisfaction rates.
Goal 4: Align university program and activities with community needs	The proposed program is designed to meet the needs both of non-traditional students who want to advance their careers and local employers who want a more professionally qualified employment base. This program offers technicians in every industry the opportunity to move into leadership roles.
Goal 5: Transform our operations to serve the contemporary mission of the university	The proposed program will take advantage of existing online options and encourage new partnerships that align with student demands and industry needs.

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.

The following measures will ensure the high quality of the new program:

Regional Institutional Accreditation: Boise State University is regionally accredited by the Northwest Commission on Colleges and Universities (NWCCU). Regional accreditation of the university has been continuous since initial accreditation was conferred in 1941. Boise State University is currently accredited at all degree levels (A, B, M, D).

Program Review: Internal program evaluations will take place every five years as part of the normal departmental review process conducted by the Office of the Provost. This process requires a detailed self-study (including outcome assessments) and a comprehensive review and site visit by external evaluators.

Program Development Support: The online Bachelor of Applied Science (BAS) is one of several that are being created via the eCampus Initiative at Boise State University. Boise State's online program development process uses a facilitated 10-step program design process to assist program faculty members in the creation of an intentional, cohesive course progression with tightly aligned course and program outcomes. A multi-expert development team, which includes

an instructional designer, multimedia specialist, graphic designer, and web designer, works collaboratively with the faculty member. One master version of each course is developed for consistent look and feel of courses across the program; the master course utilizes professional created common template aligned with nationally used Quality Matters course design standards.

Student Authentication: Because the proposed program will be offered entirely online, it is important to include mechanisms by which we authenticate the identity of students enrolled in the program. We will use the following mechanisms:

- During the admissions process, the university will confirm required official transcripts and other documentation required for admission into the program.
- During student orientation programs, academic integrity will be addressed.
- At the beginning of each course, the instructor will communicate expectations regarding academic integrity to students verbally and in the syllabus.
- Associated with access to and use of our Learning Management System, a secure log-in environment will be provided and students will be required to use strong student passwords and to change them every 90 days.
- During the design of the curriculum and assessment of each course, instructors will apply training and principles from the Quality Instruction Program offered by Boise State's eCampus Center - which includes Quality Matters best practices and WCET's Best Practice Strategies to Promote Academic Integrity in Online Education (Version 2.0, June 2009).
- Faculty members will utilize Blackboard's Safe Assignment plagiarism detection program when appropriate. Faculty members are expected to be informed of and aware of the importance of academic integrity and student identity authentication, and to report and act upon suspected violations.

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**.

    N/A

8. **Teacher Education/Certification Programs** All Educator Preparation programs require review from the Professional Standards Commission (PSC) and approval from the Board. In addition to the proposal form, the Program Approval Matrix (**Appendix C**) is required for any new and modifications to teacher education/certification programs, including endorsements. The matrix must be submitted with the proposal to OSBE and SDE using the online academic program system as one document.

    N/A

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

    Yes _____ No ___X___

    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?

    Subsequent to our last 5-year plan submission, our eCampus initiative has identified a substantial need that can be met by the proposed program. No purpose would be served by delaying the

implementation of the program until the next 5-year planning cycle.

The response to Question 2 above provides a description of need for the program. The key points of that response are:

The main points of our response to question 2 are:
- A baccalaureate degree is typically necessary for AAS graduates to move into management positions.
- 75% of the students in our existing BAS program work full-time, and would therefore likely benefit from an online program that offers more flexibility.
- An online program would provide access for students not within commuting distance from BSU. For example, 393 students graduated in 2014-15 from CSI, EITC, and NIC but have no face to face option for pursuing an AAS.
- A study by the Educational Advisory board found that given the choice, 75% of students complete the BAS online.
- Meetings with the CTE deans at CWI, CSI, and TVCC indicate substantial interest.
- There are few options to pursue BAS degrees online.
- An online BAS degree also provides access for students in the military.

   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?

Any delay in the implementation of this program will slow the growth of a more qualified labor pool in Idaho.

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.

The online BAS is a response to the immediate needs of multiple industries and technical fields and of hundreds of students throughout Idaho who are ready to advance their careers. Currently, there are very few completely online Bachelor of Applied Science (BAS) programs available in the United States, and even fewer that combine a strong core curriculum with a broadly appealing emphasis on business concepts and management skills. To repeat, any delay in the implementation of this program will slow the growth of a more qualified labor pool in Idaho.

   ii. Explain if the proposed program is reliant on external funding (grants, donations) with a deadline for acceptance of funding.

   N/A

   iii. Is there a contractual obligation or partnership opportunity to justify the program?

   N/A

   iv. Is the program request or program change in response to accreditation requirements or recommendations?

   N/A

    v.   Is the program request or program change in response to recent changes to teacher certification/endorsement requirements?

    N/A

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.

Technical credit hours transferred from an AAS:	40
Credit hours in general education curriculum or electives transferred from an AAS:	16
Credit hours in required courses offered by the department(s) offering the program:	10
Credit hours in required courses offered by other departments:	30
Credit hours in institutional general education curriculum:	24
Total credit hours required for degree program:	120

    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.

The program requires two capstone courses.

BAS 495 Capstone in the Applied Sciences (3-0-3) (FF) Analysis of a contemporary problem or issue that is of interest to the student and that occurs in the student's chosen academic/professional area of expertise. Projects will demonstrate knowledge of applied science, the ability to interpret data and relevant literature, ethical considerations and responsibilities, effective communication, and the ability to use relevant techniques to solve or assess the problem or issue. PREREQ: BAS 310 and BAS 425.

BUSBTC410 Capstone: Business Analysis (3-0-3) Uses the business plan development model introduced in BUSBTC 301 to integrate the concepts and practices developed in earlier courses. Emphasis on analyzing a sector or service of interest to student teams. Includes the further development of professional skills such as time management, career management, interpersonal relationships, and leadership. Includes team-based experiential learning. PREREQS: BUSBTC310, BUSBTC320, BUSBTC330.

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.

The Collegiate Employment/Workforce Readiness Research Report lists several skills and behaviors that are critical to succeeding in the workplace.[2] The educational objectives and

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2 Collegiate Employment/Workforce Readiness Research Report, http://career.boisestate.edu/collegiate-

student learning outcomes of the online BAS mirror that list and will prepare our students for challenging and rewarding professional opportunities.

Educational Objectives:

Students graduate with a strong foundation in:

- Complex problem-solving
- Collaboration/teamwork
- Professional ethics
- Global consciousness and social responsibility
- Judgment and decision-making
- Leadership
- Technical/analytical skills

Intended Learning Outcomes for the proposed program:

Students who graduate with a Bachelor of Applied Science have demonstrated that they can:

- Write effectively in multiple contexts, for a variety of audiences.
- Communicate effectively, both as a speaker and a listener.
- Approach complex problems creatively and collaboratively.
- Define problems clearly and gather and evaluate evidence.
- Design and implement innovative solutions to complex problems.
- Analyze and address ethical issues in personal, professional, and civic life.
- Evaluate and apply different leadership roles and styles.
- Integrate and apply business concepts and tools effectively.

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.

The Bachelor of Applied Science Program (BAS) will use required student ePortfolios to map student work (ePortfolio artifacts) to specific student learning outcomes. The BAS Assessment Committee will use a rubric to review a sampling of the artifacts to determine whether or not the student learning outcomes have been met.

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

Data will be shared with the BAS Advisory Committee and actions will be developed to address concerns that are raised.

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

- Program assessment process described in Section 12a, that is, ePortfolios that map student work (ePortfolio artifacts) to specific student learning outcomes
- Faculty grades on specific assignments

employmentworkforce-readiness/.

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

The BAS program will use a three-year assessment cycle. Three student learning outcomes will be
assessed yearly, which will provide two complete cycles of data collection every six years.

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)**			
	FY12-13	FY13-14	FY14-15	FY15-16 (most recent)	FY12-13	FY13-14	FY14-15	FY15-16 (most recent)
BSU **Existing BAS program**	137	131	117	101	36	41	30	Not yet available
ISU **BAS**		317	501	452	24	47	25	Not yet available
UI								
LCSC **BAS/BAT**		250	219	209	49	56	60	Not yet available

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: Online Bachelor of Applied Science	
Projected Fall Term Headcount Enrollment in Program	**Projected Annual Number of Graduates From Program**

FY17 (first year)	FY18	FY19	FY20	FY21	FY22	FY17 (first year)	FY18	FY19	FY20	FY21	FY22
44	128	167	206	230	243	0	28	59	59	84	84

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 numbers above are estimates based on a rate of a scale-up of the program that is reasonable and achievable given the availability of resources for course design and instruction.

We are confident that we can achieve those numbers because of our previously described efforts to assess student interest (see Question #2).

In addition, we will continue our outreach efforts, which are currently focused on CWI, CSI, and TVCC. We have strong relationships with these institutions, and we have frequent communication with their deans, department chairs, instructors, and advisors. We make several campus and classroom visits every semester. This spring, the eCampus marketing team will implement a vigorous marketing plan that will quickly expand into a statewide and regional recruiting effort.

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?

Because the program will be utilizing the online fee model, it is best to put minimum enrollment in terms of course registrations, which are what translate to revenue. Based on estimated expenses for instruction and for support personnel expenses, estimate the minimum number of course registrations to achieve breakeven is:

- Year 1: Annual credits 776, Annual FTEs 25.85
- Year 2: Annual credits 1,713, Annual FTEs 57.10
- Year 3: Annual credits 1,610, Annual FTEs 53.68
- Year 4: Annual credits 1,621, Annual FTEs 54.05
- Year 5: Annual credits 1,649, Annual FTEs 54.98

If enrollments do not meet expectations, expenses will adjust to reflect actual activity. The Program's financial sustainability will be evaluated at least annually.

Resources Required for Implementation – fiscal impact and budget

17. Physical Resources.

    a. **Existing resources**. Describe equipment, space, laboratory instruments, computer(s), or other physical equipment presently available to support the successful implementation of the program.

The available space and equipment is currently acceptable to operate a successful program.

b. **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 impact.

c. **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.

As the budget reflects, the Bachelor of Applied Science Program will purchase desktop computers, laptops, software, printers, and related equipment for online instruction for faculty and support staff.

18. **Library resources**

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.

Library resources are sufficient.

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.

None.

19. **Personnel resources**

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?

In year five, it is estimated that there will be an additional 47 sections of courses (which the program will fund) related to this program, which will require an additional 1-2 full-time lecturers and 9-24 adjuncts instructors. Additional advising resources will be required as well.

b. **Existing resources**. Describe the existing instructional, support, and administrative resources that can be brought to bear to support the successful implementation of the program.

During the first five years, it is anticipated that the following existing positions will devote their time accordingly:

- Director, Bachelor of Applied Science Program – 0.05 FTE per year

- Academic Advisor, Bachelor of Applied Science Program – 0.50 FTE per year

- Administrative Assistant II, Bachelor of Applied Science Program – 0.10 FTE per year.

   c. **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?

Fortunately, because of the scalable nature of the program, we will be able to maintain sufficient staffing (advising, administrative, instructional) to ensure that the quality and productivity of the existing face-to-face program are maintained.

   d. **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.

In year 5, we estimate the following new personnel expenses:

- Lecturers – 1.50 FTEs

- Adjunct Faculty – 3.88 FTEs

- Academic Advisors – 1.5 FTEs

20. **Revenue Sources**

   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?

   N/A

   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.

   N/A

   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?

      N/A

      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?

      N/A

   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.

The student fee will be in accordance with the Online Program Fee as defined in the Board Policy V.R., 3.a.x. That policy enables the institution to set a price-point appropriate for the program; students will pay an online program fee in lieu of tuition. The price-point for our online program fee will be as follows: we will charge the same rate as the per-credit rate for tuition and fees that is charged to resident students with the additional charge of $30 per credit online fee. We will automatically increase the fee in any years that the State Board of Education increases Boise State's per-credit rate for tuition and fees.

    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.

To estimate the cost of students (and therefore revenue to the program), it is necessary to consider that students will vary in how many credits they will transfer into the program. Most students who enter the program as direct transfers from an AAS program will enter the program with only the 55 or 56 transferrable credits that are required for an AAS. Others will enter with more credits, some of which will count for general education requirements and/or major requirements. To account for this variation in the calculation of cost to students, we will divide the credits to be taken into two parts: (i) the 40 credits that will be provided by the online program to enable a student to complete the program online and (ii) any additional credits that will be taken by the student to satisfy other minimum credit requirements for a baccalaureate degree.

- For the 40 credits offered as the online degree completion program, students will pay an online program fee that is set to the point of the rate of tuition and fees charged to resident students. Using the recently-approved FY17 rate charged per credit to resident students ($297 per credit) plus the online course fee ($30 per credit) yields a total of $327 per credit. The total cost of those 40 credits would be, for FY2017, $13,080. That cost will go up if with any increase in the per-credit cost of credits to resident students.

- The number of additional credits required, beyond the 40 described in the previous bullet, to reach the 120 to graduate will vary between zero (for students who enter with many credits beyond an AAS degree to 24 or 25 (for those students who enter with no additional credits beyond an AAS degree). Thus, the additional cost to the student to secure the BAS degree will vary between $0 and $8,175 (the latter figure calculated as 25 credits X $327 per credit). Note that the credits described in this bullet will not be offered under the online fee model. Past experience indicates that an average incoming BAS student arrives needing 9 lower division credits in addition to the 40 upper division credits accounted for in the previous bullet. The calculated additional cost for the 9 lower division credits such a student would be 9 credits X $327 per credit = $2,943.

It is important to note that as Boise State adds additional online upper division and other courses to the portfolio available to students in this program, those courses would fall under the online fee model.

21. Using the budget template 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).

INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS
JUNE 16, 2016

I. PLANNED STUDENT ENROLLMENT

	FY 2017		FY 2018		FY 2019		FY 2020		FY 2021	
	FTE	Headcount	FTE	Headcount	FTE	Headcount	FTE	Headcount	FTE	Headcount
A. New enrollments	31.5	39	92.1	115	120.1	150	148.2	185	165.4	207
B. Shifting enrollments	3.5	4	10.2	13	13.3	17	16.5	21	18.4	23
Total Enrollment	35.0	44	102.38	128	133.43	167	164.63	206	183.77	230
Student Credit Hours Generated	1,051		3,071		4,003		4,939		5,513	
Headcount Start this year		44		93		92		132		124
Headcount persist from previous year				35		74		74		105
Headcount # Graduates				28		59		59	0	84

II. REVENUE

	FY 2017		FY 2018		FY 2019		FY 2020		FY 2021	
	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
1. New Appropriated Funding Request										
2. Institution Funds										
3. Federal										
4. New Tuition Revenues from Increased Enrollments										
5. Student Fees		$343,554		$1,004,372		$1,308,948		$1,615,069		$1,802,767
6. Other (i.e., Gifts)										
Total Revenue	$0	$343,554	$0	$1,004,372	$0	$1,308,948	$0	$1,615,069	$0	$1,802,767

Budget Notes:

I.A, B. Calculation of FTE and headcount as follows:
>1 FTE = 30 credits
>Assume the average student takes 9 credits per semester and 6 in summer; 24 total per year. Therefore 1 headcount = 24 credits.
>Assume that 90% of the enrollments will be new enrollments and 10% will be shifting enrollments.
>Assume 80% persistence from first year to the second, and 80% persistence during second year to graduation.

II.5. >Student Fee revenue calculated as Student Credit Hours * $327 per credit.
>$327 calculated as $297 for 2016-2017 resident per-credit rate plus $30 per credit online fee.
>Assume in calculations that per-credit fee is stable over time; however, we will peg the fees charged to the resident per-credit fee
 charged of traditional students. Thus the cost per credit will increase at the same rate as the standard per-credit rate

III. EXPENDITURES

	FY 2017 On-going	2017 One-time	FY 2018 On-going	2018 One-time	FY 2019 On-going	2019 One-time	FY 2020 On-going	2020 One-time	FY 2021 On-going	2021 One-time
A. Personnel Costs										
1. FTE		1.48		3.40		4.89		6.23		7.03
2. Faculty		$8,542		$50,875		$44,208		$54,208		$60,875
3. Adjunct Faculty		$9,702		$41,538		$59,340		$77,142		$86,043
4. Graduate/Undergrad Assistants										
5. Research Personnel										
6. Directors/Administrators		$2,268		$2,268		$2,268		$2,268		$2,268
7. Administrative Support Personnel		$2,954		$2,954		$2,954		$2,954		$2,954
8. Fringe Benefits		$23,557		$41,857		$53,473		$66,767		$70,910
9. Other: Academic Advisors		$19,958		$19,958		$46,569		$59,874		$59,874
Total Personnel and Costs	$0	$66,981	$0	$159,450	$0	$208,812	$0	$263,213	$0	$282,924

Budget Notes (continued)

III.A.2	Faculty FTE: Calculated using (Credit hour load)/24
III.A.3	Adjunct FTE: Calculated using (Credit hour load)/30
III.A.6	Administrator: 0.05 FTE
III.A.7	Support Personnel: 0.10 FTE, Administrative Assistant
III.A.8	Benefits calculated at professional $11,200+(annual wage*21.19%), classified $11,200+(annual wage*21.49%)
III.A.9	Other - Academic Advisors: 1.5 FTEs in year 5

	FY	2017	FY	2018	FY	2019	FY	2020	FY	2021
	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
B. Operating Expenditures										
1. Travel		$1,340		$3,189		$4,176		$5,264		$5,658
2. Professional Services										
3. Other Services		$70,142		$188,095		$242,675		$299,693		$332,015
4. Communications										
5. Materials and Supplies		$670		$1,594		$2,088		$2,632		$2,829
6. Rentals										
7. Materials & Goods for Manufacture & Resale										
8. Miscellaneous - Computer Hardware/Software		$1,340		$3,189		$4,176		$5,264		$5,658
Total Operating Expenditures	$0	$73,491	$0	$196,067	$0	$253,115	$0	$312,854	$0	$346,161

Budget Notes (continued):

III.B.1	Travel to Boise State University main campus and training
III.B.3	Other Services: Instructional costs ($132 per credit) to Boise State College of Business & Economics for BAS Program students enrolled in BUSBTC courses
III.B.5	Materials & Supplies: Office supplies and materials
III.B.8	Miscellaneous: Computer hardware/software

INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS
JUNE 16, 2016

		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021	
		On-going	One-time	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	$0	$0

		FY 2017		FY 2018		FY 2019		FY 2020		FY 2021	
		On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
D. Capital Facilities Construction or Major Renovation											
E. Other Costs											
1. Scholarships		$0	$1,000	$0	$2,000	$0	$5,000	$0	$5,000	$0	$7,500
2. Boise State Central		$0	$34,355	$0	$100,437	$0	$130,895	$0	$161,507	$0	$180,277
3. Boise State eCampus Center		$0	$37,823	$0	$110,573	$0	$144,104	$0	$177,806	$0	$198,470
4. Boise State Online Innovation Fund		$0	$13,726	$0	$40,923	$0	$53,449	$0	$65,936	$0	$73,717
5. Boise State Online Marketing		$0	$87,337	$0	$262,485	$0	$343,121	$0	$423,255	$0	$473,502
6. Credit card fees		$0	$569	$0	$1,805	$0	$2,372	$0	$2,925	$0	$3,286
Utilites											
Maintenance & Repairs											
Other											
Total Other Costs		$0	$174,810	$0	$518,223	$0	$678,941	$0	$836,429	$0	$936,752
TOTAL EXPENDITURES:		$0	$315,281	$0	$873,740	$0	$1,140,868	$0	$1,412,495	$0	$1,565,836
Net Income (Deficit)		$0	$28,273	$0	$130,631	$0	$168,079	$0	$202,574	$0	$236,931

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

III.E.1	Student Scholarships
III.E.2	Boise State Central Services: A fund dedicated to funding support services for online students
III.E.3	Boise State eCampus Center: Provide funding for initiative management, online course/program development and other support services
III.E.4	Boise State Online Innovation Fund: Seed funding for academic programs, initiative infrastructure, and eventually innovation grants
III.E.5	Boise State Online Marketing, Recruitment, Enrollment and Retention Fund: A fund dedicated to marketing the program, recruiting students, enrolling qualified students and retaining students throughout the life of the program
III.E	Specifics by Course Type

	For BAS Courses	For BTC Courses
To Central as Administrative Service Fee	10.00%	10.00%
To eCampus Center	11.01%	11.01%
To Innovation Fund	4.95%	3.06%
To Marketing, Recruitment & Retention Services	34.04%	17.00%

Appendix: CURRICULUM

Online Bachelor of Applied Science	
Course Number and Title	*Credits*
Foundational Studies Program requirements indicated in **bold**. See page 50 for details and lists of approved courses.	
ENGL 101 Introduction to College Writing	3
ENGL 102 Intro to College Writing and Research	3
DLM Mathematics	3-4
DLN Natural, Physical, & Applied Sciences course with lab	4
DLN Natural, Physical, & Applied Sciences course in a second field	3-4
DLV Visual and Performing Arts	3
DLL Literature and Humanities	3-4
DLS Social Sciences course	3
DLS Social Sciences course in a second field	3
Technical Education credits	40
UF 300 Transitional Foundations	3
BAS 300 Introduction to the Applied Sciences	1
CID BAS 310 Communication in the Applied Sciences	3
BAS 425 Creating a Culture of Safety	3
FF BAS 495 Capstone in the Applied Sciences	3
BUSBTC 301 Business Foundations 1	3
BUSBTC 302 Business Foundations 2	3
BUSBTC 310 Creating Value for People	3
BUSBTC 320 Creating Value for Customers	3
BUSBTC 330 Creating Value through Investment	3
BUSBTC 410 Business Analysis	3
MDS 410 Case Studies in Leadership	3
MDS 430 Ethics	3
MDS 440 Project Management and Design	3
Electives to total 120 credits Must be academic credits. Up to 3 credits may come from KIN-ACT courses.	9-12
Total	120

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BOISE STATE UNIVERSITY

SUBJECT
Online, Bachelor of Arts Multidisciplinary Studies Program

APPLICABLE STATUTE, RULE, OR POLICY
Idaho State Board of Education Governing Policies & Procedures, Section III.G and Section V.R.

BACKGROUND/DISCUSSION
Boise State University (BSU) proposes to create an online option for its existing, degree-completion program that awards a Bachelor of Arts (BA) in Multidisciplinary Studies. The online modality will be appealing to those students for whom a face-to-face program would pose difficulties because of time and/or geographical constraints.

The proposed online expansion will provide adults with an additional avenue of access to completing a baccalaureate degree. The largest target population will be working adults who have stopped out of college after completing more than half of a BA degree and have a desire to finish a BA degree. Graduates would be able to advance in a career in which they already hold a job and for which a BA degree is necessary for that advancement and/or to enter careers that require a BA degree but not a specific major. Among those also served by the program will be individuals who are unemployed or underemployed and seeking to improve their skills and those who wish to pursue post-graduate education. There are no similar online degree completion programs at other Idaho public institutions that serve the same purpose as the proposed program.

The BA in Multidisciplinary Studies does not map to a specific profession, and therefore it is not feasible to use Department of Labor data for specific job titles to determine the number of relevant job openings. However, it is possible to gain a broad estimate of the usefulness of the degree by determining the number of individuals who do not hold bachelor's degrees but who are working in jobs that require a bachelor's degree for entry. According to Department of Labor data, 3.1 million individuals nationally and 15,515 in Idaho do not hold a bachelor's degree but are employed in jobs that require a baccalaureate degree for entry.

IMPACT
The program will operate under the guidelines of Board Policy V.R as they pertain to wholly online programs. This policy enables the institution to set a price-point appropriate for the program; students will pay an online program fee in lieu of tuition. The price-point for the proposed online program fee will be as follows: BSU will charge the same rate as the per-credit rate for tuition and fees that is charged to resident students with the additional charge of $30 per credit which matches what BSU charges per credit for online courses. BSU will

automatically increase the fee in any years that the State Board of Education increases Boise State's per-credit rate for tuition and fees, and would decrease the fee should the per-credit rate for tuition and fees be decreased.

The total cost to the student to complete the program will vary with the number of credits that the student will need to successfully complete. At a minimum, students entering the program with more than 90 transfer credits would still be required to take 30 credits at BSU. The cost to those students will be 30 credits times $327 per credit for a total of $9,810. The per-credit cost for the online program fee in this example is calculated as equivalent to the recently approved FY2017 tuition and fees rate of $297 per credit plus the online course fee of $30 per credit. The program will not require the use of any new state appropriated funds.

ATTACHMENTS
Attachment 1 – BA. Multidisciplinary Studies, Online Program Proposal   Page 5

STAFF COMMENTS AND RECOMMENDATIONS
The proposed program will serve a broad population of adult students who have previously earned academic credit and who could benefit from advancement to a baccalaureate level. BSU indicates that subsequent to the last 5-year plan submission, their eCampus initiative identified a substantial need that can be met by the proposed program, which would provide a more qualified workforce to Idaho employers and provide Idahoans with the ability to advance their level of educational attainment. Consistent with Board Policy III.Z, no institution has the statewide program responsibility for a multidisciplinary studies program. Additionally, Board Policy III.Z does not apply to programs for which 90% or more of all activity is required or completed online.

BSU also requests approval to assess an online program fee consistent with Board Policy V.R.3.a.(x). Based on the information for the online program fee provided in the proposal, staff finds that the criteria have been met for this program.

The proposal went through the program review process and was recommended for approval by the Council on Academic Affairs and Programs (CAAP) on May 26, 2016, and to the Committee on Instruction, Research, and Student Affairs (IRSA) on June 2, 2016.

Staff believes there is sufficient justification, based on regional need, for BSU to create the proposed program.

BOARD ACTION

I move to approve the request by Boise State University to create a new online, degree-completion program that will award a Bachelor of Arts in Multidisciplinary Studies in substantial conformance to the program proposal submitted as Attachment 1.

Moved by _____ Seconded by _____ Carried Yes _____ No _____

I move to approve the request by Boise State University to designate an online program fee for the Bachelor of Arts in Multidisciplinary Studies in the amount of $297 per credit in conformance with the program budget submitted to the Board in Attachment 1.

Moved by _____ Seconded by _____ Carried Yes _____ No _____

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

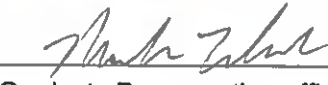|	
Date of Proposal Submission:	
Institution Submitting Proposal:	Boise State University
Name of College, School, or Division:	College of Arts and Sciences
Name of Department(s) or Area(s):	Multidisciplinary Studies

Program Identification for Proposed New or Modified Program:

Program Title:	Multidisciplinary Studies Online Degree Completion Program					
Degree:	BA	Degree Designation	X	Undergraduate		Graduate
Indicate if Online Program:	X	Yes (using online fee model)		No		
CIP code (consult IR /Registrar):	30.0000					
Proposed Starting Date:	Fall 2016					
Geographical Delivery:	Location(s)	Online		Region(s)		
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:

☐	New Degree Program	☐	Consolidation of Existing Program
☐	Undergraduate/Graduate Certificates (30 credits or more)	☐	New Off-Campus Instructional Program
[X]	Expansion of Existing Program	[x]	Other (i.e., Contract Program/Collaborative Expanding existing program to wholly online

signature	4/6/16		
College Dean (Institution)	Date	Vice President for Research (Institution; as applicable)	Date
signature	4/6/16		
~~Graduate~~ Dean or other official (Institution; as applicable)	Date	Academic Affairs Program Manager, OSBE	Date
signature	4/15/16		
FVP/Chief Fiscal Officer (Institution)	Date	Chief Academic Officer, OSBE	Date
signature	4-7-16		
Provost/VP for Instruction (Institution)	Date	SBOE/Executive Director Approval	Date
signature	4/8/16		
President	Date		

Page 1

> **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. <u>All questions must be answered</u>.

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.

    Boise State University proposes the creation of a wholly online option for our existing degree completion program that awards a BA in Multidisciplinary Studies (MDS). The new online BA in MDS program will operate under the guidelines of the newly revised SBOE Policy V.R as they pertain to wholly online programs, and it will make use of a specific set of upper division courses that are offered online (see Appendix A),

    The BA in Multidisciplinary Studies (MDS) program was created in 2008 to meet the needs of working adults in the Treasure Valley. Our largest target population are employed full-time, have stopped out of college after completing more than half of a bachelor's degree, and have a desire to finish a bachelor's degree for financial or personal benefit. The program also benefits individuals who are unemployed and seeking to improve their skills, stay at home parents and part time employees. The program is designed to enable self-directed adults to make the most of the college-level coursework that students have already completed.

    The existing program, which is a hybrid of face-to-face and online courses, will continue to be offered as it is now. However, so as to better serve those students who cannot complete the degree in a traditional delivery method, we are creating an option for students to complete the degree program wholly online.

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.

    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.

	State DOL data	Federal DOL data	Other data source: (describe)
Local (Service Area)	7758	N/A	N/A
State	15,515	N/A	N/A
Nation	N/A	3,103,081	N/A

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

The BA in MDS degree does not map to a specific profession, but instead provides graduates with the following opportunities:

- Graduates are able to enter careers that require a bachelor's degree but not a specific major. As examples, graduates of BSU's existing BA in MDS program have pursued occupations as business executives, firefighters, counselors, and federal government workers.

- Graduates are able to advance in a career in which they already hold a job and for which a bachelor's degree is necessary for that advancement.

- Graduates pursue a variety of graduate programs, e.g., Master of Social Work, Master of Business Administration, and Physician Assistant.

- According to the Bureau of Labor Statistics, individuals a bachelor's degree make, on average, 33% more than individuals without a bachelor's degree.

Because the BA in MDS does not map to a specific profession, it is not reasonable to list job titles for which the proposed program qualifies the recipient.

However, one way to gain a general estimate of workforce demand is to estimate the number of working individuals for whom a bachelor's degree would be a direct benefit. The US Department of Labor lists the degree level that is required for entry into each profession. For example, "Logistician" (SOC code 13-1081) requires a bachelor's degree for entry. The USDOL also lists the size of the workforce for each profession (130,400 logisticians in 2014) and the proportion of the workforce in each profession that holds each level of degree (11% graduate degree; 33.3% bachelor's degree; 38.8% some college, including those with an associates; and the remainder with less education). It is reasonable to conclude that the 38.8% with some college would benefit from a bachelor's degree given that their profession requires a bachelor's degree for entry.

Totaling such individuals over all professions yields 3.1 million individuals nationally with some college who are employed in jobs that require a bachelor's degree for entry. Idaho numbers can be estimated as 0.5% of national numbers, and local numbers can be estimated as 50% of Idaho numbers. See resulting numbers in the table above.

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 students was used, please attach a copy of the survey instrument with a summary of results as **Appendix A.**

Students expected to enroll in the program will be those who (i) want to enter a profession for which a bachelor's degree (but no specific major) is required, (ii) want to advance in a profession in which advancement requires a bachelor's degree, or (iii) want to enter a post-baccalaureate program for which a general bachelor's degree is sufficient qualification.

Student attracted by the online-modality of the proposed program will be those for whom a face-to-face program would pose difficulties because of time and/or geographical constraints.

We have found that typical students who enter our existing BA in MDS program have completed, on average, 89 credits, with 32 credits at the upper division level. Entering students want to make the best use of previous college credits to obtain a bachelor's degree.

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

The SBOE's Complete College Idaho plan contains the following quote from a report produced by the Office of Performance Evaluations:

"The long-term benefits of increasing educational attainment levels of Idahoans will directly impact the creation of new businesses … [and] the economic and social well-being of the state,"

The proposed program will directly contribute to the Complete College Idaho initiative by enabling a substantial number of Idahoans to increase their level of educational attainment. Importantly, the proposed degree will address the needs of a segment of Idaho's population that is substantially less likely to be able to easily pursue educational opportunities than would traditional students.

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

As people achieve higher levels of education, they are statistically less likely to commit crimes (see figure). Although he biggest gains come with graduation from high school and completing some college, there are further gains that come with graduating from college (this analysis and the accompanying figures are found in "The Economic Value of Idaho Public Colleges and Universities", 2015, a report from Economic Modeling Specialists International to the Idaho State Board of Education).

Fig. 1. Incarceration rates by education

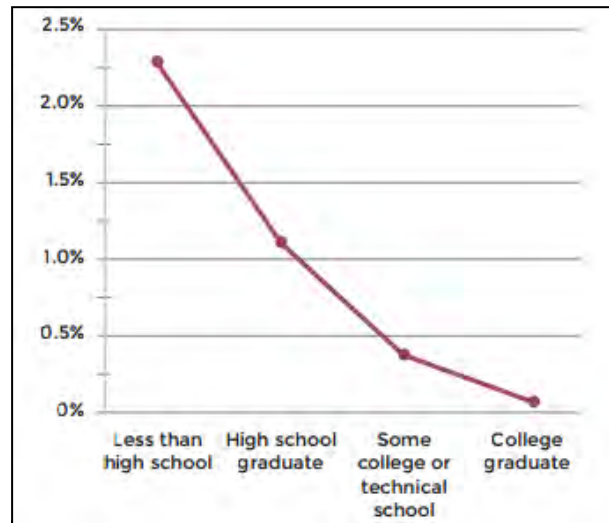Similarly, as shown in the figure, as educational level increases, unemployment rate declines.
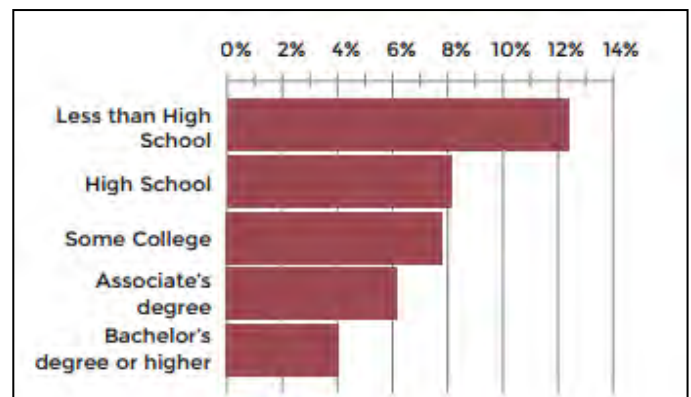

Fig. 2. Unemployment rates by educational level

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.

There are no programs at other Idaho public institutions that serve the same purpose as Boise State's BA in MDS program. Boise State's program serves a broad audience (that is, it is not specific to a particular profession) and its target audience is students who have some college and who have been away from college for at least five years.

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**

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**

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.

Not applicable; there are no similar degree completion programs at other Idaho public institutions. And those interdisciplinary programs that serve a broad audience (that is not specific to a particular profession) are not offered online and do not target students who have been out of college for at least five years.

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

Goals of Institution Strategic Plan	Proposed Program Plans to Achieve the Goal
Goal 1: Create a signature, high-quality educational experience for all students	Multidisciplinary Studies courses focus on relevant real world topics such as globalization, teamwork and ethics. For example, the required introductory course prepares students at a higher cognition level to dive deeper into areas such as critical thinking and problem solving.

Goal 2: Facilitate the timely attainment of educational goals of our diverse student population	The program uses a concierge intake and advising model that is important in achieving the 87% completion rate of our existing program. Staff members connect students to university services assisting them with successful degree completion while balancing their other demands. Advisors support a holistic approach to student success.
Goal 4: Align university program and activities with community needs	The degree completion option allows us to engage with employers to assist their employees with degree attainment while they are still working. This is especially helpful with companies who have tuition reimbursement.

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.

The following measures will ensure the high quality of the new program:

Regional Institutional Accreditation: Boise State University is regionally accredited by the Northwest Commission on Colleges and Universities (NWCCU). Regional accreditation of the university has been continuous since initial accreditation was conferred in 1941. Boise State University is currently accredited at all degree levels (A, B, M, D).

Program Review: Internal program evaluations will take place every five years as part of the normal departmental review process conducted by the Office of the Provost. This process requires a detailed self-study (including outcome assessments) and a comprehensive review and site visit by external evaluators.

Program Development Support: The online Multidisciplinary Studies (MDS) degree is one of several that are being created via the eCampus Initiative at Boise State University. Boise State's online program development process uses a facilitated 10-step program design process to assist program faculty members in the creation of an intentional, cohesive course progression with tightly aligned course and program outcomes. A multi-expert development team, which includes an instructional designer, multimedia specialist, graphic designer, and web designer, works collaboratively with the faculty member. One master version of each course is developed for consistent look and feel of courses across the program; the master course utilizes professional created common template aligned with nationally used Quality Matters course design standards.

Student Authentication: Because the proposed program will be offered entirely online, it is important to include mechanisms by which we authenticate the identity of students enrolled in the program. We will use the following mechanisms:

- During the admissions process, the university will confirm required official transcripts and other documentation required for admission into the program.
- During student orientation programs, academic integrity will be addressed.
- At the beginning of each course, the instructor will communicate expectations regarding academic integrity to students verbally and in the syllabus.

- Associated with access to and use of our Learning Management System, a secure log-in environment will be provided and students will be required to use strong student passwords and to change them every 90 days.
- During the design of the curriculum and assessment of each course, instructors will apply training and principles from the Quality Instruction Program offered by Boise State's eCampus Center - which includes Quality Matters best practices and WCET's Best Practice Strategies to Promote Academic Integrity in Online Education (Version 2.0, June 2009).
- Faculty members will utilize Blackboard's Safe Assignment plagiarism detection program when appropriate. Faculty members are expected to be informed of and aware of the importance of academic integrity and student identity authentication, and to report and act upon suspected violations.

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**.

    N/A

8. **Teacher Education/Certification Programs** All Educator Preparation programs require review from the Professional Standards Commission (PSC) and approval from the Board. In addition to the proposal form, the Program Approval Matrix (**Appendix C**) is required for any new and modifications to teacher education/certification programs, including endorsements. The matrix must be submitted with the proposal to OSBE and SDE using the online academic program system as one document.

    N/A

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

    Yes _____   No __X__

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

    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?

    Subsequent to our last 5-year plan submission, our eCampus initiative has identified a substantial need that can be met by the proposed program. No purpose would be served by delaying the implementation until the next 5-year planning cycle.

    The response to Question 2 above provides a description of need for the program. The key points of that response are:
    - The proposed program will fulfill the need for those individuals who need a bachelor's degree that is not tied to a specific discipline, and for whom the degree will enable job entry or advancement.
    - An estimated 7,758 individuals in Boise State's service area do not have a bachelor's degree but are in jobs for which a bachelor's degree is typically required for entry; it is reasonable to conclude that these individuals would benefit from receiving a baccalaureate degree.
    - Many of the students in our existing MDS program work full time, and would

therefore have more flexibility in an online program. The same accessibility would appeal to students outside of commuting distance.

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?

Any delay in the creation of the program will slow the growth of a more qualified workforce and would delay the availability of a program by which Idahoans can advance their level of educational attainment.

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.

The purpose of the proposed program is to provide a more qualified workforce to Idaho employers and to provide Idahoans with the ability to advance their level of educational attainment.

ii. Explain if the proposed program is reliant on external funding (grants, donations) with a deadline for acceptance of funding.

N/A

iii. Is there a contractual obligation or partnership opportunity to justify the program?

Not at this time.

iv. Is the program request or program change in response to accreditation requirements or recommendations?

N/A

v. Is the program request or program change in response to recent changes to teacher certification/endorsement requirements?

N/A

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.	46
Credit hours in required courses offered by other departments:	0

Credit hours in institutional general education curriculum (from AA/AS degree)	35
Credit hours in free electives (at Boise State or transfer credits)	39
Total credit hours required for degree program:	120

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.

In their first semester in the program students develop an Individual Degree Plan (IDP). The IDP is a customized degree plan based on personal and professional goals they develop. Identified courses in the online program are justified against their personal and professional goals. Students may do an internship at a location of their choosing. This supervised fieldwork is designed to receive academic credit for professional experience that is relevant to the student's Individual Degree Plan (IDP) goals. During the internship students develop objectives related to their personal and professional goals developed in their IDP.

The Capstone experience in MDS 400 requires that the student perform 15 hours of service-learning, write a major research paper or project, and publically present the results. The student must use critical thinking skills, communication strategies, and content expertise to analyze a problem or issue related to life and career goals.

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.

Program Objectives:

The online degree in Multidisciplinary Studies (MDS) degree is designed to meet the needs of adult students with significant life experience (e.g., military, volunteer work, parenting). The program's curriculum allows adult students to best utilize previously earned academic credit and focus their efforts on enrolling in those credits needed to complete a bachelor's degree.

Through a supportive and stimulating learning experience, graduates of the Multidisciplinary Studies (MDS) degree are prepared to integrate, synthesize and apply critical thinking, problem solving, ethics, communication skills and cultural perspectives, personally and professionally. The Individual Degree Plan (IDP) is a customized degree plan based on personal and professional goals they develop. Identified courses in the online degree are justified against their personal and professional goals.

Intended Learning Outcomes:

Students who complete the BA in MDS program will be able to do the following:

1. Define problems and opportunities, gather and evaluate evidence and determine the adequacy of a given argument in order to continually make connections from my academic discipline(s) to real world situations.

2. Apply knowledge and understanding of cultural differences from my academic discipline(s) to matters that encompass local to international importance that demonstrate a well-rounded view of the world.

3. Utilize 21st Century Skills and knowledge to write effectively in multiple contexts for a variety of audiences.

4. Utilize 21st Century Skills and knowledge to communicate effectively in speech, both as speaker and listener.

5. Think creatively about complex problems in order to produce, evaluate and implement innovative solutions as a member of a team.

6. Analyze ethical issues in personal, professional and civic life and produce reasoned evaluations of competing moral and ethical viewpoints.

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.

    Through the use of student ePortfolios required in the program, graduates will submit one artifact of their best work achieved through the courses they complete for each of the six intended learning outcomes. The program Assessment Committee will use a rubric to review a sampling of these to determine if program intended learning outcomes objectives are being met.

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

    Data will be shared with the Multidisciplinary Studies (MDS) Advisory Committee and actions will be developed to address the concerns that are raised.

    c. **Measures used.** What direct and indirect measures will be used to assess student learning?
- Program Assessment process described in Section 12a
- Faculty grades on specific assignments

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

    Two program outcomes will be assessed yearly on a three-year rotation.

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)**			
	FY13	FY14	FY15	FY16 (most recent)	FY13	FY14	FY15	FY16 (most recent)
BSU	97	120	149	267	59	56	62	71
ISU	N/A							
UI	N/A							
LCSC	N/A							

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: Multidisciplinary Studies Degree (MDS) Senior Year Online Degree Completion											
Projected Fall Term Headcount Enrollment in Program						**Projected Annual Number of Graduates From Program**					
FY17 (first year)	FY18	FY19	FY20	FY21	FY22	FY17 (first year)	FY18	FY19	FY20	FY21	FY22
100	222	256	299	341	350		59	95	111	128	130

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 numbers above are estimates based on a rate of a scale-up of the program that is reasonable and achievable given the availability of resources for course design and instruction.

We are confident that we can achieve those numbers because of our previously described efforts to assess student interest (see Question #2).

In addition, ongoing partnerships with two-year colleges allow students to complete an associate's

degree and then move to Boise State to complete their BA in MDS.

This spring, the eCampus marketing team will implement a vigorous marketing plan that will quickly expand into a statewide and regional recruiting effort.

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?

Adjusting for instruction expenses and maintaining anticipated support personnel expenses, the approximate minimum enrollment required to breakeven is:

- Year 1: Annual Credits 1,096, Annual FTEs 36.53

- Year 2: Annual Credits 2,748, Annual FTEs 91.59

- Year 3: Annual Credits 3,942, Annual FTEs 131.41

- Year 4: Annual Credits 4,427, Annual FTEs 147.57

- Year 5: Annual Credits 4,995, Annual FTEs 166.51

If enrollments do not meet expectations, expenses will adjust to reflect actual activity. The Program's financial sustainability will be evaluated at least annually.

Resources Required for Implementation – fiscal impact and budget

17. **Physical Resources.**

   a. **Existing resources**. Describe equipment, space, laboratory instruments, computer(s), or other physical equipment presently available to support the successful implementation of the program.

   Existing resources are sufficient.

   b. **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 impact.

   c. **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.

   Student and staff computers will need to be upgraded over time and is built into the proposed budget. The program does not require any additional equipment, space or laboratory instruments.

18. **Library resources**

   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.

With an online program, library resources will be accessed electronically. They are adequate for the operation of the program.

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.

No additional resources will be required to accommodate this program besides staffing to respond to student questions. This is typical expected growth for the University.

19. **Personnel resources**

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?

Initial implementation of the program will not require any additional personnel resources. By year 5 of the program, it is currently estimated that the program will require an additional 5.63 FTEs in professors, lecturers and adjunct instructors, all of which will be funded by fees from the program

b. **Existing resources**. Describe the existing instructional, support, and administrative resources that can be brought to bear to support the successful implementation of the program.

Additional faculty and staff are built into the budget to accommodate the anticipated growth.

During the first five years, it is anticipated that the following existing positions will devote their time accordingly:

- Director, Multidisciplinary Studies– 0.30 FTE
- Academic Advisor (existing) – 1.00 FTE
- Academic Coordinators – 1.00 FTE
- Administrative Assistants – 0.45 FTE

c. **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?

Fortunately, because of the scalable nature of the program, we will be able to maintain sufficient staffing (advising, administrative, instructional) to ensure that the quality and productivity of the existing face-to-face program are maintained.

d. **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.

By year 5 of the program, we estimate the following new personnel expenses will be needed:
- Faculty (Professors & Lecturers) – 0.63 FTE
- Adjunct Faculty – 5.00 FTEs
- Academic Advisors/Coordinators – 0.50 FTEs

20. **Revenue Sources**

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?

N/A

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.

No new appropriation will be required.

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?

      N/A

   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?

      N/A

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.

The student fee will be in accordance with the Online Program Fee as defined in the Board Policy V.R., 3.a.x. That policy enables the institution to set a price-point appropriate for the program; students will pay an online program fee in lieu of tuition. The price-point for our online program fee will be as follows: we will charge the same rate as the per-credit rate for tuition and fees that is charged to resident students with the additional charge of $30 per credit online fee. We will automatically increase the fee in any years that the State Board of Education increases Boise State's per-credit rate for tuition and fees.

   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.

To estimate the cost to students (and therefore revenue to the program from the online program fee), it is necessary to consider that students will vary in how many credits they will transfer into the program. For the purposes of illustration and for revenue calculation, we divided the students into three groups:

- Approximately 40% of students enter the program with 90 or more transfer credits. Those students will need to take only 30 credits in the program, which is the minimum number a student must take and still meet residency requirement. The cost to those students will be 30 credits times $327 per credit (the online program fee) for a total of $9,810. The per-credit rate will be matched to the current rate charged per credit to resident students. Here we use the recently approved FY2017 rate of $297 per credit plus the online course

fee of $30 per credit.

- Approximately 30% of the students will enter the program needing to take 46 credits, which is the entire set of courses that will be offered in this program. The cost to those students will be 46 credits times $327 per credit for a total of $15,042.

- Approximately 30% of students will enter the program will enter the program requiring an average of 12 credits in addition to the 46 offered by the program. The cost to those students can be divided into two components. One component will be the 46 credits offered by the program times $327 per credit for a subtotal of $15,042. Those funds will constitute revenue for the program. The second component will be the average 12 credits needed in addition to the 46 of the program times $327 per credit for a subtotal of $3,924. The total cost (for both components) would be $18,966. Note that the credits in the second component will not be offered under the online fee model.

The per-credit rate charged to students enrolled in the online MDS program required courses will equal the Boise State University per credit rate for a resident plus the online per credit course fee. Students enrolled in the online MDS program required courses or online courses outside the program will pay the same per credit amount.

Note that as Boise State adds additional online upper division and other courses to the portfolio available to students in this program, those courses would fall under the online fee model.

21. Using the budget template 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).

INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS
JUNE 16, 2016

I. PLANNED STUDENT ENROLLMENT

	FY 2017		FY 2018		FY 2019		FY 2020		FY 2021	
	FTE	Headcount	FTE	Headcount	FTE	Headcount	FTE	Headcount	FTE	Headcount
A. New enrollments	39.3	90	119.1	200	149.0	230	173.9	269	199.5	307
B. Shifting enrollments	4.4	10	13.2	22	16.6	26	19.3	30	22.2	34
Total Enrollment	43.7	100	132.3	222	165.6	256	193.3	299	221.6	341
Student Credit Hours Generated	1,311		3,969		4,967		5,798		6,649	

II. REVENUE

	FY 2017		FY 2018		FY 2019		FY 2020		FY 2021	
	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
1. New Appropriated Funding Request										
2. Institution Funds										
3. Federal										
4. New Tuition Revenues from Increased Enrollments										
5. Student Fees		$428,648		$1,297,913		$1,624,265		$1,930,401		$2,213,874
6. Other (i.e., Gifts)										
Total Revenue	$0	$428,648	$0	$1,297,913	$0	$1,624,265	$0	$1,930,401	$0	$2,213,874

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.

Budget Notes:

I.A, B. Calculation of FTE and headcount as follows:

>1 FTE = 30 credits

>Headcount determined as the distinct number of students in the program that year.

>Assume that 90% of the enrollments will be new enrollments and 10% will be shifting enrollments.

>Assume 6% attrition from one semester to the next.

II.5. >Student Fee revenue calculated as Student Credit Hours * $327 per credit.

>$327 calculated as $297 for 2016-2017 resident per-credit rate plus $30 per credit online fee.

>Assume in calculations that per-credit fee is stable over time; however, we will peg the fees charged to the resident per-credit fee

charged of traditional students. Thus the cost per credit will increase at the same rate as the standard per-credit rate

INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS
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III. EXPENDITURES

	FY 2017 On-going	FY 2017 One-time	FY 2018 On-going	FY 2018 One-time	FY 2019 On-going	FY 2019 One-time	FY 2020 On-going	FY 2020 One-time	FY 2021 On-going	FY 2021 One-time
A. Personnel Costs										
1. FTE		1.90		5.52		6.46		7.46		8.88
2. Faculty		$23,300.00		$42,014.00		$63,478.00		$68,628.00		$78,046.00
3. Adjunct Faculty		$23,736.00		$107,412.00		$119,880.00		$129,981.00		$156,117.00
4. Graduate/Undergrad Assistants										
5. Research Personnel										
6. Directors/Administrators		$7,619.00		$11,657.00		$15,854.00		$20,214.00		$24,741.00
7. Administrative Support Personnel				$4,335.00		$8,895.00		$13,583.00		$13,855.00
8. Fringe Benefits		$25,983.74		$55,697.87		$80,958.04		$99,146.24		$118,953.11
9. Other: Academic Advisors/Coordinators		$19,755.00		$40,300.00		$61,658.00		$83,855.00		$106,915.00
Total Personnel and Costs	$0	$100,394	$0	$261,416	$0	$350,723	$0	$415,407	$0	$498,627

Budget Notes (continued)

III.A.2	Faculty FTE: Calculated using (Credit hour load)/24
III.A.3	Adjunct FTE: Calculated using (Credit hour load)/30
III.A.6	Administrator: Increasing annually to 0.30 FTE by year 5
III.A.7	Support Personnel (Administrative Assistant): Increasing annually to 0.45 FTE by year 5
III.A.8	Benefits calculated at professional $11,200+(annual wage*21.19%), classified $11,200+(annual wage*21.49%)
III.A.9	Other - Academic Advisors/Coordinators: Increasing annually to 2.5 FTEs by year 5

INSTRUCTION, RESEARCH, AND STUDENT AFFAIRS
JUNE 16, 2016

	FY	2017	FY	2018	FY	2019	FY	2020	FY	2021
	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time	On-going	One-time
B. Operating Expenditures										
1. Travel		$2,902		$7,672		$9,349		$6,164		$7,413
2. Professional Services										
3. Other Services		$57,677		$209,514		$256,242		$299,567		$343,724
4. Communications										
5. Materials and Supplies		$2,902		$7,672		$9,349		$6,164		$7,413
6. Rentals										
7. Materials & Goods for Manufacture & Resale										
8. Miscellaneous - Computer Hardware/Software		$3,870		$10,230		$12,466		$8,219		$9,883
Total Operating Expenditures	$0	$67,352	$0	$235,089	$0	$287,406	$0	$320,114	$0	$368,433

Budget Notes (continued):
III.B.1   Travel to Boise State University main campus and training
III.B.3   Other Services: Instructional costs ($132 per credit) to Boise State College of Business & Economics for BA MDS Program students enrolled in BUSBTC courses
III.B.5   Materials & Supplies: Office supplies and materials
III.B.8   Miscellaneous: Computer hardware/software

	FY 2017 On-going	FY 2017 One-time	FY 2018 On-going	FY 2018 One-time	FY 2019 On-going	FY 2019 One-time	FY 2020 On-going	FY 2020 One-time	FY 2021 On-going	FY 2021 One-time
C. Capital Outlay										
1. Library Resources										
2. Equipment										
Total Capital Outlay	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

	FY 2017 On-going	FY 2017 One-time	FY 2018 On-going	FY 2018 One-time	FY 2019 On-going	FY 2019 One-time	FY 2020 On-going	FY 2020 One-time	FY 2021 On-going	FY 2021 One-time
D. Capital Facilities Construction or Major Renovation										
E. Other Costs										
1. Scholarships	$0	$2,000	$0	$4,000	$0	$10,000	$0	$10,000	$0	$15,000
2. Boise State Central	$0	$44,467	$0	$134,160	$0	$167,976	$0	$199,704	$0	$229,028
3. Boise State eCampus Center	$0	$47,191	$0	$142,890	$0	$178,818	$0	$212,521	$0	$243,729
4. Boise State Online Innovation Fund	$0	$19,258	$0	$56,452	$0	$70,964	$0	$84,605	$0	$97,019
5. Boise State Online Marketing, Recruitment, Enrollment & Retention Fund	$0	$119,226	$0	$346,997	$0	$436,639	$0	$520,932	$0	$597,362
6. Credit card fees	$0	$1,408	$0	$4,079	$0	$5,136	$0	$6,131	$0	$7,030
Utilites										
Maintenance & Repairs										
Other										
Total Other Costs	$0	$233,550	$0	$688,578	$0	$869,533	$0	$1,033,893	$0	$1,189,168
TOTAL EXPENDITURES:	$0	$401,296	$0	$1,185,082	$0	$1,507,662	$0	$1,769,414	$0	$2,056,228
Net Income (Deficit)	$0	$27,352	$0	$112,831	$0	$116,603	$0	$160,987	$0	$157,645

Budget Notes

III.E.1	Student Scholarships	
III.E.2	Boise State Central Services: A fund dedicated to funding support services for online students	
III.E.3	Boise State eCampus Center: Provide funding for initiative management, online course/program development and other support services	
III.E.4	Boise State Online Innovation Fund: Seed funding for academic programs, initiative infrastructure, and eventually innovation grants	
III.E.5	Boise State Online Marketing, Recruitment, Enrollment and Retention Fund: A fund dedicated to marketing the program, recruiting students, enrolling qualified students and retaining students throughout the life of the program	
III.E	Specifics by Course Type	

	For BAS Courses	For BTC Courses
To Central as Administrative Service Fee	10.56%	10.00%
To eCampus Center	11.01%	11.01%
To Innovation Fund	5.21%	3.06%
To Marketing, Recruitment & Retention Services	33.22%	17.00%

Appendix A
CURRICULUM

Program Statement

The Bachelor of Arts in Multidisciplinary Studies degree is designed to meet the needs of adult students with significant life experience who have already completed fifty-eight credit hours of college credit. Students will work closely with an academic advisor to develop an academic degree plan through which they can meet their stated goals and university core learning outcomes. The student's degree plan must meet the requirements of and be approved by the Multidisciplinary Studies Advisory Committee. Students desiring a discipline-specific course of study should consider traditional majors.

Admission Requirements

Admission to the Bachelor of Arts in Multidisciplinary Studies program requires a minimum of 58 credits earned with a 2.25 GPA. All transfer credit accepted toward the Bachelor of Arts in Multidisciplinary Studies degree must have a grade of C- or better. In addition, significant life experience may include full-time paid or volunteer employment, military experience, family care-provider/parent, or other non-academic life experience.

Online Multidisciplinary Studies Bachelor of Arts	
Course Number and Title	*Credits*
Foundational Studies Program requirements indicated in **bold**. See page 50 for details and lists of approved courses.	
ENGL 101 Introduction to College Writing	3
ENGL 102 Intro to College Writing and Research	3
UF 100 Intellectual Foundations	3
UF 200 Civic and Ethical Foundations	3
DLM Mathematics	3-4
DLN Natural, Physical, & Applied Sciences course with lab	4
DLN Natural, Physical, & Applied Sciences course in a second field	3-4
DLV Visual and Performing Arts	3
DLL Literature and Humanities	3-4
DLS Social Sciences course	3

DLS Social Sciences course in a second field	3
CID MDS 300 Communicating Universally	3
FF MDS 400 Capstone for the BA in Multidisciplinary Studies	3
Choose 21 credits from upper-division courses listed below: MDS 410: Case Studies in Leadership MDS 420: Globalization MDS 430: Ethics MDS 440: Project Management and Design MDS 450: Teamwork and Innovation MDS 493: Internship BUSBTC 301: Business Foundations I BUSBTC 302: Business Foundations II BUSBTC 310: Creating Value with People BUSBTC 320 Creating Value with Customers BUSBTC 330 Creating Value through Investment BUSBTC 410 Capstone: Business Analysis Upper-division courses will be selected in collaboration with the program advisor based on the student's educational goals and a degree plan approved by the Multidisciplinary Studies Advisory Committee. These courses must be completed during or after successful completion of MDS 300. The design must be clearly linked to the stated educational objectives of the program.	21
Upper-division electives to total 40 credits For students enrolled in the online program, these elective credits must be taken from the list in the preceding box.	13
Electives to total 120 credits	43-46
Total	120
Students must maintain a 2.25 GPA for all major requirements.	

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COLLEGE OF WESTERN IDAHO

SUBJECT

Approval of a new Construction Technology Program

APPLICABLE STATUTE, RULE, OR POLICY

Idaho State Board of Education Governing Policies & Procedures, Section III.G

BACKGROUND/DISCUSSION

The College of Western Idaho (CWI) proposes to establish a new Construction Technology program, which would offer an Associate of Applied Science (AAS) degree and an Intermediate Technical Certificate upon completion of program requirements. The program will enable local construction companies to obtain skilled workers in a field that is projected to need 7,000 workers over the next eight years.

IMPACT

Funds for the program have been identified internal to CWI's Division of Career-Technical Education (DCTE) budget to fully fund the program expenses.

ATTACHMENTS

Attachment 1 – Construction Technology Program Proposal   Page 3

STAFF COMMENTS AND RECOMMENDATIONS

The proposed program aligns with CWI's Service Region Program Responsibilities and is included on their Five-Year Plan update to be considered at the August Board meeting. CWI projects the program will have capacity for 20 students to start, with 20 students projected in subsequent years.

The DCTE has reviewed the request and recommends Board approval. The proposal went through the program review process and was recommended for approval by the Council on Academic Affairs and Programs (CAAP) on May 26, 2016. The Instruction, Research, and Student Affairs committee recommended approval at their June 2, 2016 meeting.

BOARD ACTION

I move to approve the request by the College of Western Idaho to offer a new Construction Technology program in substantial conformance to the proposal provided in Attachment 1.

Moved by _____ Seconded by _____ Carried Yes _____ No _____

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Idaho State Board of Education
Proposal for **Professional-Technical Certificate/Degree** Program

Date of Proposal Submission: February 2016

Institution Submitting Proposal:	College of Western Idaho
Name of College, School, or Division:	Professional Technical Education
Name of Department(s) or Area(s):	Trades and Technical Programs

Program Identification for Proposed New or Modified Program:

Program Title:	Construction Technology
CIP code (consult IR /Registrar):	46.0415
Proposed Starting Date:	August 2016

Indicate whether this request is either of the following:

[X] **New Program (check all that apply)**
- [ ] Basic Technical Certificate
- [X] Intermediate Technical Certificate
- [ ] Advanced Technical Certificate
- [X] Associate of Applied Science Degree

[ ] **Consolidation of Existing Program**

[ ] **New Off-Campus Instructional Program**

[ ] **Other (i.e., Contract Program/Collaborative**

[ ] **Expansion of Existing Program (check all that apply)**
- [ ] Basic Technical Certificate
- [ ] Intermediate Technical Certificate
- [ ] Advanced Technical Certificate
- [ ] Associate of Applied Science Degree

[signature] 2/16/16	_____
College Dean (Institution) Date	State Administrator, IDPTE Date
[signature] 2/22/16	
FVP/Chief Fiscal Officer (Institution) Date	SBOE/Executive Director Approval Date
[signature] 2/16/16	
Provost/VP for Instruction (Institution) Date	
[signature] 2-23-16	
President Date	

Page 1

> **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 or expansion of each new program. <u>All questions must be answered.</u>

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 programs that this program will replace.

   The College of Western Idaho requests action to add a new PTE Associate of Applied Science degree and Intermediate Technical Certificate in Construction Technology that will enable local construction companies to obtain skilled workers.

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

   Construction/Carpentry is among the State of Idaho's top "Hot Jobs." There is a projected need of 7000 workers in this field over the next eight years. We expect to have around 15 graduates per year in this program.

   a. Provide verification of regional and 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.

	State DOL data	Federal DOL data	Other data source: (describe)
Regional (Service Area)			
State	223 annual openings		
Nation			

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

3. **Describe how this request supports the institution's vision and/or strategic plan.**
   The College of Western Idaho provides affordable, quality teaching and learning opportunities for all to excel at learning for life. By having a construction program we are providing more opportunities for students.

4. **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.
   Program quality will be assured by completion of a yearly program assessment. All programs at CWI complete this process annually. This assessment measures retention, completion and placement of students.

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

    Yes __X__ No _____

    If not:

    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?
        NA

    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?
        NA

        i.   How important is the program in meeting your institution's regional 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?

Curriculum, Intended Learning Outcomes, and Assessment Plan

6. **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.	49
Credit hours in institutional general education curriculum	15
Total credit hours required for program	64

7. **Program Intended Learning Outcomes and Connection to Curriculum.** 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. **Attach a PTE Program Profile (Attachment B).**

    1. Students will analyze construction prints to include: site, foundation, floor, electrical, plumbing and structural plans, sectional and detailed views.
    2. Students will gain the ability to use manual and power equipment typically used in the construction industry in a safe manner.
    3. Students will demonstrate problem solving, informational literacy, technological and communication skills in team and individual learning exercises.

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4. Student will exhibit a sense of pride in one's work and the desire to progress and excel in the construction profession.
5. Students will learn the skills that will promote occupational growth and life-long learning.

   a. **List any industry certifications students will be able to achieve during the duration of this program.**
     NA

8. **Assessment Plans**
   a. **Assessment Process and Measures Used.** Describe the assessment process that will be used to evaluate how well students are achieving the intended learning outcomes of the program. What direct and indirect measures will be used to assess student learning?
     National Center for Construction Education and Research end of program Assessment.

   b. **Closing the loop.** How will you ensure that the assessment findings will be used to improve the program?
     Through the end of program assessment test and our program assessment process, initiatives will be put in place to make improvements to the program.

Enrollments and Graduates

9. **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											
Projected Headcount Enrollment in Program						Projected Number of Graduates From Program					
FY16__ 1st year	FY_17 _	FY18_ _	FY19_ _	FY20_ _	FY21_ _	FY16__ 1st year _	FY17_ _	FY18_ _	FY19_ _	FY20_ _	FY21_ _
20	20	20	20	20	20	00	16	16	16	16	16

10. **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? How did you determine the projected numbers above?

This program will have a capacity of 20 students. We expect this program to fill with the need for this program and the wage student are able to earn ($16.00 per hour). We put the capacity at 20 because that is a number that can be safely supervised by one person.

11. **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 time frame for meeting minimums, and what is the action that would result if minimums are not?

We will need at least ten students in this program to make it successful. We will project at meeting that minimum the first year of the program. If the minimum cannot be meet within three years the program will be reevaluated.

Resources Required for Implementation

Page 4

12. **Physical Resources.**

    a. **Existing resources.** Describe equipment, space, laboratory instruments, computer(s), or other physical equipment presently available to support the successful implementation of the program.
- 1000 Sq. Ft. lab space
- 20 computers

    b. **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 impact to other programs

    c. **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.
- Tools

13. **Personnel resources**

    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?
- Full time faculty(program chair)
- Adjunct Faculty

    b. **Existing resources.** Describe the existing instructional, support, and administrative resources that will support the successful implementation of the program.
- Assistant Dean
- Admin Assistant

    c. **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.
I do not foresee any major impact on existing resources or personnel

    d. **Needed resources.** List the new personnel that must be hired to support the proposed program. Enter the costs of those physical resources into the budget sheet.
- Full time faculty member
- Adjunct Instructor

14. **Revenue Sources**

    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?
Culinary Arts program is being suspended, some of these funds will be allocated for the construction program

    b. **New appropriation.** If a line item request is required to fund the program, indicate when the institution plans to submit the request to the Division of Professional-

Page 5

Technical Education or include in the legislative budget request.
NA

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

  NA

  ii. Describe the federal grant, other grant(s), special fee arrangements, or contract(s) to fund the program. How does the institution propose to continue the program upon termination of those funds?
  NA

d. **Student Fees**: Provide estimated total semester cost to students, including all fees authorized under V.R.
  $2250.00

Program Resource Requirements. Provide a realistic estimate of costs needed for the overall program. This should only include the additional costs that will be incurred and not current costs. Include both the reallocation of existing resources and anticipated or requested new resources. Second and third year estimates should be in constant dollars. 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 the proposed discontinuance to include impacts to faculty (i.e., salary savings, re-assignments).

A. REVENUE

	FY 2016-2017 On-going	2016-2017 One-time	FY 2017=2018 On-going	2017=2018 One-time	FY 2018-2019 On-going	2018-2019 One-time	Cumulative Total On-going	Cumulative Total One-time
1. Appropriated (Reallocation)	$125,000.00	$135,000.00	$125,000.00		$125,000.00		$375,000.00	$135,000.00
2. Appropriated (New)							$0.00	$0.00
3. Federal							$0.00	$0.00
4. Tuition							$0.00	$0.00
5. Student Fees							$0.00	$0.00
6. Other (Specify)							$0.00	$0.00
Total Revenue	$125,000.00	$135,000.00	$125,000.00		$125,000.00	$0.00	$375,000.00	$135,000.00

B. EXPENDITURES

	FY 2016-2017 On-going	2016-2017 One-time	FY 2017-2018 On-going	2017-2018 One-time	FY 2018-2019 On-going	2018-2019 One-time	Cumulative Total On-going	Cumulative Total One-time
1. Personnel	$110,000.00		$110,000.00		$110,000.00		$330,000.00	$0.00
2. Operating	$15,000.00		$15,000.00		$15,000.00		$45,000.00	$0.00
3. Equipment		$135,000.00						$135,000.00
4. Facilities							$0.00	$0.00
5. Other (Specify)							$0.00	$0.00
Total Expenditures	$125,000.00	$135,000.00	$125,000.00	$0.00	$125,000.00	$0.00	$375,000.00	$135,000.00
Net Income (Deficit)	$0.00	$0.00	$0.00		$0.00	$0.00	$0.00	$0.00

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.

Program Proposal Budget Template
(Baccalaureate, Graduate, Doctorate)
March 7, 2012
Page 1

IDAHO

Division of
Professional-Technical Education

PTE

PTE ATTACHMENT B
(Program Profile)

Indicate the nature of this submission

X	New Program (option, certificate, or degree)		Non-Substantive Change(s)
	Expansion of an Existing Program (An addition of a certificate or degree to an existing program)		Other (please list)

Please submit a separate PTE Attachment B for each new program, expansion, or non-substantive change.

Date Submitted **December 7 2015**

Effective Date **Fall 2016**

Institution **College of Western Idaho**

Program/Option Title **Construction Technology**

Insert Program Name/Option Title (i.e. Business Technologies/Marketing and Management)

Degree/Certificate **Associate of Applied Science**

If a Certificate, indicate type (i.e. Technical, Advanced Technical or Postsecondary Technical)

CIP Code Number **46.0415**

CIP Code Title **Building Construction Technology**

SOC Code Examples* **47-2781, 47-1011, 47-2031**

TSA **National Center for Construction Education and Research**

Revised 7/13

STUDENT LEARNING OUTCOMES

1. Students will analyze construction prints to include: site, foundation, floor, electrical, plumbing and structural plans, sectional and detailed views.
2. Students will gain the ability to use manual and power equipment typically used in the construction industry in a safe manner.
3. Students will demonstrate problem solving, informational literacy, technological and communication skills in team and individual learning exercises.
4. Student will exhibit a sense of pride in one's work and the desire to progress and excel in the construction profession.
5. Students will learn the skills that will promote occupational growth and life-long learning.

NEW PROGRAM OR OPTION

1. Describe how this request is consistent with the Division of Professional-Technical Education's strategic plan.
   This program aligns with the PTE strategic plans- Goal 1: A well-educated citizenry and Goal 2: Effective and efficient delivery system-ensure resources are used effectively

2. Describe the discussion with PTE and the TCLC regarding this request.
   The Dean of PTE at the College of Western Idaho has shared information about the addition of this program with the Idaho State Division of Professional Technical Education.

3. Provide advisory committee/industry input supporting this request.
   A construction technology credit program is being requested by industry, mainly local contractors, to meet the demand for local construction labor and managerial needs

4. What is your plan to mitigate the impact this request will have on similar secondary and postsecondary programs (e.g. advanced learning opportunity, early college, distributed/hybrid)?
   We believe there is room for opportunity without disrupting other programs, since the only other program in construction is at NIC and we do not plan on disrupting NIC. There are plenty of openings in our geographic area.

Revised 7/13

NON-SUBSTANTIVE CHANGE

Changes to a program name or title changes (e.g., programs, degrees, certificates, departments, divisions, colleges, or centers), Course number/prefix change, Course title change, Credit/lab/contact hour change, Semester offered change, Catalog description change, Co-/Prerequisite change, Create new Course(s), Delete existing course(s).

1. Describe the impact this change will have on students currently enrolled in the existing program.
2. Provide advisory committee/industry input supporting this change.
3. What is your plan to mitigate the impact this change will have on similar secondary and postsecondary programs (e.g. advanced learning opportunity, early college, distributed/hybrid)?

COURSE SEQUENCE

FIRST SEMESTER			
Course Prefix & Number	**Course Title**	**Credits**	**Gen Ed/ Technical**
CONS 101	Intro to Construction	3	T
CONS 102	Tools of the Trade	3	T
CONS 103	Blueprints for construction	3	T
CONS 104	Intro to Concrete	2	T
GEM 1	English Composition 1	3	G
Total		14	

SECOND SEMESTER			
Course Prefix & Number	**Course Title**	**Credits**	**Gen Ed/ Technical**
CONS 105	Construction Materials and Methods 1	3	T
CONS 106	Framing Applications	2	T
CONS 107	Construction Lab 1	5	T
CONS 108	Exterior Finish	2	T
GEM 3	Mathematical Ways of Knowing	3	G
Total		15	

Revised 7/13

SUMMER SEMESTER			
Course Prefix & Number	**Course Title**	**Credits**	**Gen Ed/ Technical**
CONS 109	Construction Lab 2	4	T
CONS 110	Building Science	3	T
GE Elective	Any additional General Ed Course from approved list	3	G
Total		**10**	

THIRD SEMESTER			
Course Prefix & Number	**Course Title**	**Credits**	**Gen Ed/ Technical**
CONS 210	Construction Materials and Methods 2	3	T
CONS 211	Interior Finish	2	T
CONS 212	Construction Lab 3	5	T
GEM 2	Oral Communication	3	G
Total		**13**	

FOURTH SEMESTER			
Course Prefix & Number	**Course Title**	**Credits**	**Gen Ed/ Technical**
CONS 213	Construction Management	5	T
CONS 214	Advanced Concrete	4	T
GEM 6	Social and Behavioral Ways of Knowing	3	G
Total Credits		**12**	

Summary	
General (Academic) Education	**15**
Technical Credits	**49**
Grand Total	**64**

COURSE TITLES, DESCRIPTIONS AND CREDITS

CONS 101 –Intro to Construction (3 CREDITS, FALL)

This course is an introduction to the construction trade and its application as a career in the industry. Basic building materials and construction methods are thoroughly covered in preparation for the program's construction of a house. Interpretation of both commercial and residential plans and blueprints, applicable building codes, building layout will be discussed. This course has a laboratory component which applies classroom curriculum to assigned shop projects; it will include appropriate local field trips, as well as site preparation and layout for the fall and spring semester's class project house. **COREQ:** CONS 102

CONS 102 – Tools of the Trade (3 CREDITS, FALL)
This course introduces and emphasizes safe and proper use of the tools of the construction trade. Hand tools, hand held power tools, and shop-based bench power tools are covered. The laboratory component of this course includes assigned projects in the shop as well as activities on-campus or on-site. Laboratory projects are designed to require use of all tools and procedures covered in the classroom.

CONS 103 – Blueprints for Construction (3 CREDITS, FALL)
This course covers detailed interpretations of both residential and commercial blueprints, specific engineered shop drawings, models, sketches, and other representations of construction projects. Students will learn to identify and use critical building information contained in the plans, including accurate dimensioning and the meanings of architectural notations and symbols. Related and required municipal building codes are thoroughly covered as they apply to house construction. Classroom time includes a heavy construction math emphasis, as the class does materials take-offs from a variety of plans and creates a materials list and budget for the house. Laboratory time is spent practicing house layout procedures with a variety of plans, particularly the current project house plans. On-site, the house is located and laid out and preparations are made for excavation. As time permits through the semester, students will independently plan, sketch, and lay out smaller projects and side jobs around the CWI campus and local community.   **PRE/COREQ:** CONS 101.

CONS 104 – Intro to Concrete (2 CREDITS, FALL)
This course is designed to impart knowledge about the characteristics of concrete as a building material, and its many forms and uses in construction. Concrete's chemical composition, specific terminology, estimating methods, and common related building codes are thoroughly covered. Aspects of site preparation, including soils and excavation

knowledge, are also covered. This course is intended to give students the skills and knowledge to construct standard forms for footings, foundation stem walls, flatwork, and stairs. Skills and methods taught in class are practiced as students construct the required concrete forms and place the concrete for a house. Also covered are concrete's related products, including code required steel reinforcement, concrete masonry units (CMU's), insulated concrete forms (ICF's), and decorative concrete products such as stamped and colored concrete, manufactured stone veneers, bricks, blocks, and others. Course curriculum is delivered through classroom lecture, independent student research, and class field trips. **PRE/COREQ:** CONS 101

CONS 105 – Construction Materials and Methods 1 (3 CREDITS, SPRING)

This course covers a broad range of both current and timeless construction materials and methods with an emphasis on problem solving, tool savvy and building techniques which are directly applicable to carpentry work on a residential construction site. The classroom curriculum includes a text and special calculator, classroom lecture, after-class research and assignments, field trips, websites and visitors from the community and industry. The laboratory time consists primarily of building a house, with other projects around the CWI campus and local community added as time permits. Special attention is given to all construction safety issues, especially tool use and OSHA standards. Sustainable, energy efficient green building practices are infused into all course curriculum. **PREREQ:** CONS 101

CONS 106 – Framing Applications (2 CREDITS, SPRING)

This course will teach students how to frame a residential structure from the foundation to the roof. Framing terminology, dimensional and manufactured lumber, floor frame systems, wall framing, roof framing, and truss systems are fully covered. A special construction calculator is required and used to determine and lay out walls, rafter cuts, and stairs. Advanced green framing techniques are explored and emphasized. Classroom topics include applicable building codes pertaining to framing, an array of available fastener systems, commercial metal stud framing, balloon framing, post and beam framing. **PREREQ:** CONS 101

CONS 107 – Construction Lab 1 (5 CREDITS, SPRING)

This course is an on-site, hands-on laboratory application of all student learning outcomes from previous and corequisite construction courses. There is heavy and frequent tool and equipment use, climbing of scaffolds and ladders, caring for lumber and other building materials, and working in any kind of weather. Safety issues and OSHA standards are practiced daily. Students will build a house, with time made for other smaller projects and side jobs benefitting the CWI campus and the local community. Work is most often completed by small groups of students using their own

basic tools with ample opportunity for both leadership and team player roles. Emphasis is placed on real-world construction industry demands for critical thinking, problem solving, positive work ethic, and teamwork.

CONS 108 – Exterior Finish (2 CREDITS, SPRING)

This course applies exterior building finish theory from other or previous CONS courses directing students' mental and physical efforts at the program project house. Class time will deal with which and how much specific exterior building materials will be bought and how the class will install them. Particular emphasis will be placed on applicable codes and covenants, strong building science and the most current best construction practices. Main theory and activities include closing the building envelope, siding and window installation, roofing, exterior trim, concrete flatwork prep, decks and anything else that is required to complete the project house's exterior, making it ready for the painter.

CONS 109 – Construction Lab 2 (4 CREDITS ,SUMMER)

This course is an on-site, hands-on laboratory application of all student learning outcomes from previous construction courses. There is heavy and frequent tool and equipment use, climbing of scaffolds and ladders, caring for lumber and other building materials, and working in any kind of weather. Safety issues and OSHA standards are practiced daily. Students will build a house, with time made for other smaller projects and side jobs benefitting the CWI campus and the local community. Work is most often completed by small groups of students using their own basic tools with ample opportunity for both leadership and team player roles. Emphasis is placed on real-world construction industry demands for critical thinking, problem solving, positive work ethic, and teamwork. Carpentry students start with site preparation and excavation, work through concrete footings and foundation, and end the term with a framed house.

CONS 110 – Building Science (3 CREDITS, SUMMER)

This classroom portion of this course covers building structures as complete systems that will perform predictably. Classroom time will cover issues surrounding building science, including but not limited to: types and strengths of construction materials, insulation, ventilation, rating and testing programs for building sustainability and livability, as well as "green" building best practices. Special attention is paid to required codes and construction techniques as they apply to the program's class project. The laboratory component of this course will reinforce classroom building theory with activities that center around completing the building envelope, including siding and window installation, air-infiltration sealing and making way for professional subcontractors hired to completes the main house systems. Students will have the opportunity to plan, observe and participate in all testing and inspection procedures.

Revised 7/13

CONS 210 – Construction Materials and Methods 2 (3 CREDITS, FALL)

This course covers the broad range of both current and timeless construction materials and methods introduced in CONS-105. Emphasis remains on problem solving, tool savvy and building techniques directly applicable to carpentry work on a construction site, but now especially as it relates to interior and exterior finish work, and building science topics. Classroom curriculum includes text and special calculators, classroom lecture, after-class research and assignments, field trips, on-line research, and visitors from the community and industry. Laboratory time continues to primarily consist of building. Other projects around the CWI campus and local community are added as time permits. Special attention is given to construction safety issues, especially tool use and OSHA standards. Sustainable, energy efficient green building practices are infused into all course curriculum. **PREREQ:** CONS 105

CONS 211 – Interior Finish (2 CREDITS, FALL)

This course applies interior building finish theory from other or previous CONS courses directing students' mental and physical efforts at the program project house. Class time will deal with which, and how much, specific interior finish materials will be bought and how the class will install them. Particular emphasis will be placed on applicable codes and covenants, strong building science and the most current best construction practices. Main theory and activities include prepping for sheetrock installation and painting, learning about multiple construction trim tools and methods, hanging and trimming all doors, observe/assist the cabinet installation, lay out and construct stairs as well as anything else that is required to complete the project house's interior. **PREREQ:** CONS 103

CONS 212 – Construction Lab 3 (5 CREDITS, FALL)

This course is an on-site, hands-on laboratory application of all student learning outcomes from previous carpentry courses. There is heavy and frequent tool and equipment use, climbing of scaffolds and ladders, caring for lumber and other building materials, and working in any kind of weather. Safety issues and OSHA standards are practiced daily. Students will be completing construction of a house, with time made for other smaller projects and side jobs benefiting the CWI campus and the local community. Work is completed by individual and small groups of students using their own basic tools and ample opportunity for both leadership and team player roles. Emphasis is placed on real-world construction industry demands for critical thinking, problem solving, positive work ethic, and teamwork. This relationship continues through siding, exterior finishing, interior door hanging and trimming. The term ends with a completed house.

CONS 213 – Construction Management (5 CREDITS, SPRING)

This course consists of weekly theory and field study. Students will obtain experience in planning and management of various construction projects that are part of the program's laboratory curriculum. Cost and materials estimating, advanced math concepts applied to construction projects, worksite issues/ethics, advanced communication skills, and construction scheduling and estimating are applied under supervision. In addition, advanced specialty construction skills will be addressed according to student's individual preferences. Weekly seminars will provide opportunities for students to share experiences, debrief, and obtain faculty assistance in applying theory concepts to field experience. **PREREQ:** CONS 141

CONS 214 – Advanced Concrete (4 CREDITS, SPRING)

This course consists of theory and lab work which entails advanced form construction and reinforcement.   Custom concrete finishing work and intricate stairway construction. Describe and perform the procedure for casting and erecting tilt-up concrete walls. Student will become familiar with the process used to lay brick and concrete masonry units.

IDAHO
Division of
Professional-Technical Education
PTE

PTE ATTACHMENT B
(Program Profile)

Indicate the nature of this submission

X	New Program (option, certificate, or degree)		Non-Substantive Change(s)
	Expansion of an Existing Program (An addition of a certificate or degree to an existing program)		Other (please list)

Please submit a separate PTE Attachment B for each new program, expansion, or non-substantive change.

Date Submitted	**December 7 2015**
Effective Date	**Fall 2016**
Institution	**College of Western Idaho**
Program/Option Title	**Construction Technology**
	Insert Program Name/Option Title (i.e. Business Technologies/Marketing and Management)
Degree/Certificate	**Intermediate Technical Certificate**
	If a Certificate, indicate type (i.e. Technical, Advanced Technical or Postsecondary Technical)
CIP Code Number	**46.0415**
CIP Code Title	**Building Construction Technology**
SOC Code Examples*	**47-2781, 47-1011, 47-2031**
TSA	**National Center for Construction Education and Research**

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STUDENT LEARNING OUTCOMES

1. Students will analyze construction prints to include: site, foundation, floor, electrical, plumbing and structural plans, sectional and detailed views.
2. Students will gain the ability to use manual and power equipment typically used in the construction industry in a safe manner.
3. Students will demonstrate problem solving, informational literacy, technological and communication skills in team and individual learning exercises.
4. Student will exhibit a sense of pride in one's work and the desire to progress and excel in the construction profession.
5. Students will learn the skills that will promote occupational growth and life-long learning.

NEW PROGRAM OR OPTION

1. Describe how this request is consistent with the Division of Professional-Technical Education's strategic plan.
   This program aligns with the PTE strategic plans- Goal 1: A well-educated citizenry and Goal 2: Effective and efficient delivery system-ensure resources are used effectively

2. Describe the discussion with PTE and the TCLC regarding this request.
   The Dean of PTE at the College of Western Idaho has shared information about the addition of this program with the Idaho State Division of Professional Technical Education

3. Provide advisory committee/industry input supporting this request.
   A construction technology credit program is being requested by industry, mainly local contractors to meet the demand for local construction labor and managerial needs.

4. What is your plan to mitigate the impact this request will have on similar secondary and postsecondary programs (e.g. advanced learning opportunity, early college, distributed/hybrid)?
   We believe there is room for opportunity without disrupting other programs, since the only other program in construction is at NIC and we do not plan on disrupting NIC. There are plenty of openings in our geographic area

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NON-SUBSTANTIVE CHANGE

Changes to a program name or title changes (e.g., programs, degrees, certificates, departments, divisions, colleges, or centers), Course number/prefix change, Course title change, Credit/lab/contact hour change, Semester offered change, Catalog description change, Co-/Prerequisite change, Create new Course(s), Delete existing course(s).

1. Describe the impact this change will have on students currently enrolled in the existing program.
2. Provide advisory committee/industry input supporting this change.
3. What is your plan to mitigate the impact this change will have on similar secondary and postsecondary programs (e.g. advanced learning opportunity, early college, distributed/hybrid)?

COURSE SEQUENCE

FIRST SEMESTER			
Course Prefix & Number	Course Title	Credits	Gen Ed/ Technical
CONS 101	Intro to Construction	3	T
CONS 102	Tools of the Trade	3	T
CONS 103	Blueprints for construction	3	T
CONS 104	Intro to Concrete	2	T
GEM 1 Or GEM 2	Written Communication course Oral Communication course	3	G
Total		14	

SECOND SEMESTER			
Course Prefix & Number	Course Title	Credits	Gen Ed/ Technical
CONS 105	Construction Materials and Methods 1	3	T
CONS 106	Framing Applications	2	T
CONS 107	Construction Lab 1	5	T
CONS 108	Exterior Finish	2	T
GEM 3	Mathematical Ways of Knowing	3	G
Total		15	

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SUMMER SEMESTER			
Course Prefix & Number	**Course Title**	**Credits**	**Gen Ed/ Technical**
CONS 109	Construction Lab 2	4	T
CONS 110	Building Science	3	T
GEM 6	Social and Behavioral Ways of Knowing course	3	G
Total		**10**	

Summary	
General (Academic) Education	**9**
Technical Credits	**30**
Grand Total	**39**

Revised 7/13

COURSE TITLES, DESCRIPTIONS AND CREDITS

CONS 101 – Intro to Construction (3 CREDITS, FALL)

This course is an introduction to the construction trade and its application as a career in the industry. Basic building materials and construction methods are thoroughly covered in preparation for the program's construction of a house. Interpretation of both commercial and residential plans and blueprints, applicable building codes, and building layout will be discussed. This course has a laboratory component that applies classroom curriculum to assigned shop projects; it will include appropriate local field trips, as well as site preparation and layout for the Fall and Spring semester's class project house. **COREQ:** CONS 102.

CONS 102 – Tools of the Trade (3 CREDITS, FALL)

This course introduces and emphasizes safe and proper use of the tools of the construction trade. Hand tools, hand held power tools, and shop-based bench power tools are covered. The laboratory component of this course includes assigned projects in the shop as well as activities on-campus or on-site. Laboratory projects are designed to require use of all tools and procedures covered in the classroom.

CONS 103 – Blueprints for Construction (3 CREDITS, FALL)

This course covers detailed interpretations of both residential and commercial blueprints, specific engineered shop drawings, models, sketches, and other representation of construction projects. Students will learn to identify and use critical building information contained in the plans, including accurate dimensioning and the meanings of architectural notations and symbols. Related and required municipal building codes are thoroughly covered as they apply to house construction. Classroom time includes a heavy construction math emphasis, as the class does materials take-offs from a variety of plans and creates a materials list and budget for the house. Laboratory time is spent practicing house layout procedures with a variety of plans, particularly the current project house plans. On-site, the house is located and laid out and preparations are made for excavation. As time permits, through the semester students will independently plan, sketch, and lay out smaller projects and side jobs around the CWI campus and local community.   **PRE/COREQ:** CONS 101.

CONS 104 – Intro to Concrete (2 CREDITS, FALL)

This course is designed to impart knowledge about the characteristics of concrete as a building material, and its many forms and uses in construction. Concrete's chemical composition, specific terminology, estimating methods, and common related building codes are thoroughly covered. Aspects of site preparation, including soils and excavation knowledge, are also covered. This course is intended to give students the skills and

knowledge to construct standard forms for footings, foundation stem walls, flatwork, and stairs. Skills and methods taught in class are practiced as students construct the required concrete forms and place the concrete for a house. Also covered are concrete's related products, including code required steel reinforcement, concrete masonry units (CMU's), insulated concrete forms (ICF's), and decorative concrete products such as stamped and colored concrete, manufactured stone veneers, bricks, blocks, and others. Course curriculum is delivered through classroom lecture, independent student research, and class field trips. **PRE/COREQ:** CONS 101

CONS 105 – Construction Materials and Methods 1 (3 CREDITS, Spring)

This course covers a broad range of both current and timeless construction materials and methods with an emphasis on problem solving, tool savvy and building techniques which are directly applicable to carpentry work on a residential construction site. The classroom curriculum includes a text and special calculator, classroom lecture, after-class research and assignments, field trips, websites and visitors from the community and industry. The laboratory time consists primarily of building a house, with other projects around the CWI campus and local community added as time permits. Special attention is given to all construction safety issues, especially tool use and OSHA standards. Sustainable, energy efficient green building practices are infused into all course curriculum. **PREREQ:** CONS 101

CONS 106 – Framing Applications (2 CREDITS, SPRING)

This course will teach students how to frame a residential structure from the foundation to the roof. Framing terminology, dimensional and manufactured lumber, floor frame systems, wall framing, roof framing, and truss systems are fully covered. A special construction calculator is required and used to determine and lay out walls, rafter cuts, and stairs. Advanced green framing techniques are explored and emphasized. Classroom topics include applicable building codes pertaining to framing, an array of available fastener systems, commercial metal stud framing, balloon framing, post and beam framing. **PREREQ:** CONS 101

CONS 107 – Construction Lab 1 (5 CREDITS, SPRING)

This course is an on-site, hands-on laboratory application of all student learning outcomes from previous and corequisite construction courses. There is heavy and frequent tool and equipment use, climbing of scaffolds and ladders, caring for lumber and other building materials, and working in any kind of weather. Safety issues and OSHA standards are practiced daily. Students will build a house, with time made for other smaller projects and side jobs benefitting the CWI campus and the local community. Work is most often completed by small groups of students using their own basic tools with ample opportunity for both leadership and team player roles. Emphasis

is placed on real-world construction industry demands for critical thinking, problem solving, positive work ethic, and teamwork.

CONS 108 – Exterior Finish (2 CREDITS, SPRING)

This course applies exterior building finish theory from other or previous CONS courses directing students' mental and physical efforts at the program project house. Class time will deal with which and how much specific exterior building materials will be bought and how the class will install them. Particular emphasis will be placed on applicable codes and covenants, strong building science and the most current best construction practices. Main theory and activities include closing the building envelope, siding and window installation, roofing, exterior trim, concrete flatwork prep, decks and anything else that is required to complete the project house's exterior, making it ready for the painter.

CONS 109 – Construction Lab 2 (4 CREDITS, SUMMER)

This course is an on-site, hands-on laboratory application of all student learning outcomes from previous construction courses. There is heavy and frequent tool and equipment use, climbing of scaffolds and ladders, caring for lumber and other building materials, and working in any kind of weather. Safety issues and OSHA standards are practiced daily. Students will build a house, with time made for other smaller projects and side jobs benefitting the CWI campus and the local community. Work is most often completed by small groups of students using their own basic tools with ample opportunity for both leadership and team player roles. Emphasis is placed on real-world construction industry demands for critical thinking, problem solving, positive work ethic, and teamwork. Carpentry students start with site preparation and excavation, work through concrete footings and foundation, and end the term with a framed house.

CONS 110 – Building Science (3 CREDITS, SUMMER)

This classroom portion of this course covers building structures as complete systems that will perform predictably. Classroom time will cover issues surrounding building science, including but not limited to: types and strengths of construction materials, insulation, ventilation, rating and testing programs for building sustainability and livability as well as "green" building best practices. Special attention is paid to required codes and construction techniques as they apply to the program's class project. The laboratory component of this course will reinforce classroom building theory with activities that center around completing the building envelope, including siding and window installation, air-infiltration sealing and making way for professional subcontractors hired to complete the main house systems. Students will have the opportunity to plan observe and participate in all testing and inspection procedures.

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NORTH IDAHO COLLEGE

SUBJECT
 Approval of Aerospace Technology Substantive Program Changes

APPLICABLE STATUTE, RULE, OR POLICY
Idaho State Board of Education Governing Policies & Procedures, Section III.G.

BACKGROUND/DISCUSSION
In 2012, North Idaho College (NIC) was awarded a $2.9 million Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant to develop an Aerospace Center of Excellence in Aviation Maintenance and Advanced Manufacturing. In 2013, NIC began offering the Aerospace Technology program. Since that time this program has expanded to include multiple stackable credentials leading to an Associates of Applied Science (AAS) degree. To date, 106 students have enrolled in the program; 74 have completed one or more certificates and 16 have completed the Advanced Technical Certificate (ATC) or AAS degree. Lessons learned during the initial offerings of this program have led to the request to make substantive changes to the program curriculum. All options will be impacted by these revisions.

IMPACT
This change represents improvements to an existing program and offers more flexibility to students to choose courses more in line with their career goals. In addition, the number of credits required for the AAS degree has been reduced to 60-62 credits. No added spending or additional funds are being requested for the implementation of these changes.

ATTACHMENTS
Attachment 1 – Aerospace Technology Program Proposal   Page 3

STAFF COMMENTS AND RECOMMENDATIONS
Employment in aviation maintenance and advanced manufacturing is growing rapidly in northern Idaho and requires a highly skilled workforce. NIC's proposed changes to the program create a well-defined stackable credential program that prepares students for an entry-level job and promotions in the aerospace career path.

The Division of Career-Technical Education has reviewed the request and recommends Board approval. The proposal went through the program review process and was also recommended for approval by the Council on Academic Affairs and Programs (CAAP) on May 26, 2016. The Instruction, Research, and Student Affairs committee recommended approval at their June 2, 2016, meeting.

BOARD ACTION

I move to approve the request by North Idaho College to make substantive changes to the Aerospace Technology program in substantial conformance to those specified in Attachment 1.

Moved by _____ Seconded by _____ Carried Yes _____ No _____

Institutional Tracking No. _____

Idaho State Board of Education

Proposal for Other Academic Program Activity and Professional-Technical Education

Date of Proposal Submission:	3/14/16
Institution Submitting Proposal:	North Idaho College
Name of College, School, or Division:	Aerospace Technology Division
Name of Department(s) or Area(s):	Aerospace Technology

Program Identification for Proposed New, Modified, or Discontinued Program:

Title:	Aerospace Technology Advanced Manufacturing
Degree:	AAS, Advanced Technical Degree; and Basic Technical Certificates
Method of Delivery:	Professional Technical Program with a combination of theory and lab classes.
CIP code (consult IR /Registrar)	15.0801
Proposed Starting Date:	Fall 2016
Indicate if the program is:	X Regional Responsibility	Statewide Responsibility

Indicate whether this request is either of the following:

☐ New Program (minor/option/emphasis or certificate)	☐ Discontinuance of an Existing Program/Option
☐ New Off-Campus Instructional Program	☐ Consolidation of an Existing Program
☐ New Instructional/Research Unit	☒ Expansion of an Existing Program
☐ Contract Program/Collaborative	☐ Other

signature 3-14-16			
College Dean (Institution) Date		Vice President for Research (as applicable) Date	
Graduate Dean (as applicable) Date		State Administrator, SDPTE (as applicable) Date	
signature 3/15/16			
Chief Fiscal Officer (Institution) Date		Academic Affairs Program Manager Date	
signature Rita A. Burns 3/15/16			
Chief Academic Officer (Institution) Date		Chief Academic Officer, OSBE Date	
signature Rita A. Burns for Joe Dunlap 3/15/16			
President Date		SBOE/OSBE Approval Date	

February 15, 2016
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