ACADEMIC PROGRAM PROPOSAL FORM

DIRECTIONS: *Use this form when proposing a new major or primary field of study, new emphasis, new degree program, or new certificate of achievement.*

DATE SUBMITTED: 2/1/2015

INSTITUTION: Nevada State College

Date of AAC Approval:	March 4, 2015

REQUEST TYPE:
☐ New Degree
☒ New Major or Primary Field of Study
☐ New Emphasis
☐ New Certificate of Achievement (AAC approval only)

Date of Board Approval:

DEGREE (i.e. Bachelor of Science): Bachelor of Applied Science

MAJOR (i.e. Animal Science): Engineering Technology

EMPHASIS (i.e. Equine Studies): Computer Networking; Telecommunications; Electronics

CREDITS TO DEGREE: 122-127 (depending on option)

CERTIFICATE OF ACHIEVEMENT: N/A

PROPOSED SEMESTER OF IMPLEMENTATION: Fall 2015

Action requested:
Establish a Bachelor of Applied Science (BAS) degree in Engineering Technology

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A. Brief description and purpose of proposed program

The proposed 3+1 program between CSN and NSC would provide an opportunity for students to earn a Bachelor of Applied Science (BAS) in Engineering Technology degree at NSC after completing an Associate of Applied Science (AAS) in Computer Information Technology-Networking at CSN. This 3+1 degree program would have students complete their AAS degree at CSN, then take advanced technical courses at CSN during their junior year. They would then transfer to NSC for their senior year to take upper-division courses in management and upper-division courses in the areas of humanities and cultural diversity to complete their core curriculum. Students would choose one of three options for the degree: Computer Networking, Electronics, or Telecommunications.

To build a 4-year degree that meets all requirements for a bachelor's degree while including sufficient technical training to meet ABET accreditation standards and local industry needs, it was necessary to include more than 120 credits in the BAS-Engineering Technology tracks. Students will

enter the program at NSC with more than 60 credits, because in order to train students sufficiently in the technical skills needed, two of CSN's AAS Engineering Technology tracks, Electronics, and Telecommunications, require more than 60 credits. The Electronics emphasis requires 64, while the Telecommunications emphasis requires 63.

The BAS-ET program would produce engineering technologists with technical skills that are in demand in Nevada, as well as the management and communication knowledge needed to work in management positions in industry.

B. Statement of degree or program objectives
The learning objectives associated with the BAS-ET Computer Networking degree are:
1. Demonstrate advanced technical proficiency in computer networking, electronics, or telecommunications technology.
2. Integrate leadership, human resource management, quality assurance, productivity analysis, and customer service management skills into the workplace.
3. Model work-based experience gained from accredited programs and coursework monitored by business and industry subject matter experts in regularly held advisory committees.
4. Evaluate principles of management and organizational behavior in the workplace.
5. Explain why employability skills such as communciation, teamwork, critical thinking, problem solving, and other "soft skills" are vitally important in the workplace.

C. Plan for assessment of degree or program objectives
The assessment method at NSC will include a bi-annual outcomes assessment of program learning outcomes (see below for detailed discussion). In addition we will continually monitor the growth of the program and make any necessary expansion in course offerings, additional faculty, and/or campus resources. Surveys of alumni will be developed and disseminated to assess job readiness, placement, and promotion. Lastly, surveys of student satisfaction with the degree offerings will also be conducted.

CSN develops multi-year assessment plans for all programs. Program and course objectives are also evaluated by business and industry advisory committees and the accreditation board.

D. Plan for assessment of student learning outcomes and the use of this data for program improvement
At NSC, the process of Outcomes Assessment occurs on a bi-annual basis for all degree programs. In October, the Dean of the College of Liberal Arts and Sciences, in consultation with area Department Chairs, selects assessment chairs for each program under review, who in turn selects a three-person committee of faculty reviewers. This committee typically consists of three individuals with expertise in the discipline under examination, but often will include a strategically-selected faculty member from outside of the discipline. In broad terms, the committee targets a single learning outcome, randomly selects student "artifacts" (i.e., major assignments) that presumably reflect outcome performance, and then devises a rubric to evaluate the artifacts. The resulting scores and qualitative observations are incorporated into a formal report that describes the strengths and weaknesses of the program and renders suggested revisions. The revisions are implemented and the process begins anew as faculty gauge the extent to which the program has improved.

Several essential methodological elements enhance the quality and consistency of this process:

1. Outcome alignment
Faculty strive to develop clear, concise learning outcomes that reflect meaningful achievements in the area of study. At the outset of each assessment cycle, faculty also are asked to carefully align these learning outcomes with institutional and school-wide missions and consensus goals of the

field. In this fashion, we consistently ensure that each program contributes to larger strategic objectives and maximizes each student's potential for success in his or her respective field.

2. Sound evaluative techniques

Our assessment process is anchored by several proven methodological techniques. Many of these techniques are general reflections of best practices in research methodology, but they also derive from the Nichols assessment system (Nichols & Nichols, 2005), which undergirds our assessment philosophy.

3. Clear rubric

Assessment is most effective if the evaluation of student performance is guided by a rubric that minimizes ambiguity by relying on clear, widely understood definitions and rating scales. A rubric is "a predefined scoring scheme to guide the analysis of student performance or artifacts" (Nicholas & Nichols, 2005, p. 110). It is applied as a set of rules for evaluating student performance and it establishes a criterion by which the student will be deemed successful (e.g., at least a 3 on a 4-point scale).

To this end, rubrics "set a common understanding among multiple judges about what represents success in student learning" (Nichols & Nichols, 2005, p. 110). The rubric answers fundamental questions about how student performance will be measured, it discriminates between high and low quality student work, and it helps ensure that our judgments are valid and reliable. In general terms, it does this by clearly identifying several criteria by which a student's performance can be judged (e.g., relied on empirical data, provided a clear thesis statement, etc.) and then by delineating performance levels for each criterion (e.g., unsatisfactory, satisfactory, proficient, & excellent).

4. Random Sampling

A random and robust sample of student work (referred to as "artifacts") in this circumstance is our best chance of taking a representative snapshot of NSC student performance, and thereby is most likely to guide improvements that assist a broad proportion of our student population. Moreover, the artifacts selected for analysis are "key assessments" – culminating assignments that are designed to showcase important student knowledge and skills.

5. Interrater Reliability

Evaluating student work is an inherently subjective process that is particularly susceptible to the predilections of an individual evaluator. To minimize this subjectivity, each artifact is assessed by multiple independent raters, and the mean of these ratings is the critical outcome variable that guides recommendations about program changes. Moreover, the ratings from each evaluator are held to a high standard of inter-rater reliability to ensure that there is strong agreement among the different ratings, thereby ensuring that the outcome variable is not unduly influenced by the biases of a single individual.

6. Value added

For each outcome we assess a sample of student artifacts from lower division classes and a separate sample from upper division courses. In this fashion we can estimate how much progress students have made over time as a result of the quality of the instruction and curriculum in our law enforcement program.

7. Iterative philosophy

Importantly, the act of assessment does not exist in isolation; rather, it is a process that yields recommendations, the implementation of those recommendations, and a follow-up assessment to determine the effectiveness of the changes. At the close of this basic three-stage cycle, the process

begins anew, which in many ways is the only response to a constantly evolving discipline and the ever-changing needs of businesses, organizations, and the community.

E. Contribution and relationship of program objectives to

   i. NSHE Master Plan
   The proposed BAS-ET program at NSC parallels the NSHE Master Plan in the following ways:

   1. A prosperous economy: The proposed BAS-ET 3+1 agreement between CSN and NSC will provide students with an opoprtunity to pursue a 4-year degree that is currently unavailable in southern Nevada. This will enhance their employment opportunities and address the need among businesses in the area for employees with more skills and knowledge in Engineering Technology than a 2-year degree is able to provide. Currently employers look outside the state for sufficiently qualified employees. The NSHE Plan for Nevada's College and Universities states that Nevada must "produce more entry-level graduates if the State is to become competitive and more economically prosperous" (p. 6). The BAS-ET program would address this concern by providing an avenue to a 4-year degree for students who currently have no educational options beyond the associate's level. A survey commissioned by CSN of 123 local engineering industry administrators indicates a need for this program. More than a third (37.6%) of the respondents said they have found it difficult to find qualified employees for technical occupations; at the time of the survey, just under half (44.1%) estimated they would add positions in the next year (RCG Economics & UNLV Cannon Survey Center, p. 4).

   2. Student focused: Students will have the opportunity to take advanced technical classes where they will work with networking equipment, electornics and telecommunications systems, fiber optics, radar and microwave, data acquisition systems, and more during their junior year at CSN. They will then transfer to NSC, where they will complete their degree. NSC offers small class sizes and highly-qualified faculty who can prepare students with the skills and knowledge needed to enter management positions.

   3. Opportunity and accessible education for all: Nevada State College prides itself on providing open access to students who may not be eligible for admission into research-oriented universities. In this regard we offer educational opportunities to a special niche of students, similar to all of the established majors at NSC. They provide the expanded opportunity and accessibility that the Board desires.

   ii. Institutional mission
   At Nevada State College, excellence fosters opportunity. Excellence in teaching leads to innovative, technology-rich learning opportunities that promote the acquisition of interdisciplinary knowledge and skills. Quality, affordable four-year degree programs open the door to career success and enhanced quality of life for a diverse population of students. Our graduates, in turn, foster the greatest opportunity--the promise of a stronger community and a better future for all of Nevada. The following section (iii) discusses how the proposed BAS-ET program fits within this mission and within the Strategic Plan of the College.

   iii. Campus strategic plan and/or academic master plan
   Nevada State College recently completed its 2015-2020 Academic Strategic Plan. The proposed BAS-ET program addresses a number of goals in the strategic plan:

   1. Expand BAS programs with the community colleges: NSC already offers BAS degrees in Management and Criminal Justice, including a fast-track BAS-Management partnership with

TMCC that offers tailored 5-week courses that are consistent with their accelerated AAS program. Partnering with CSN is a logical step in our efforts to provide more BAS degrees statewide.

2. Foster educational opportunity: the BAS-ET degree will provide an educational pathway for students who otherwise do not have one. This will allow students who earn an AAS to finish a four-year degree.

3. Imbue students with functional and marketable skills that promote opportunities for career, graduate school, and personal success: A BAS degree will give students additional technical and management training beyond the associate's level, opening up career opportunities that are not realistic options for those with a two-year degree.

4. Maintain administrative efficiency: by partnering with CSN for a 3+1 degree, this program takes advantage of the strengths of both institutions. Students will complete their advanced technical courses at CSN, which has excellent facilities that meet the standards required by their accrediting agency, the Accreditation Board for Engineering and Technology (ABET). NSC already offers a high-quality business degree that includes the upper-division management, communication, and other courses employers seek when considering individuals for managerial positions. Thus, this 3+1 program reduces redundancy in NSHE and takes advantage of the existing strenths and missions of the two institutions.

iv. **Department and college plan**
The BAS-ET will be housed in the Department of Social Sciences and Business Administration. The Business Administration program emphasizes technology and innovation as ways to meet the evolving demands of the modern market, with a solid understanding of management and organizational behavior principles combined with a liberal arts foundations that develops students' communication, conflict negotiation, and critical thinking skills.

The BAS-ET degree is in line with these departmental goals, as it will provide students with both technical knowledge and managerial and communication skills, preparing them to be successful employees with skills that have already been identified as in-demand among Nevada industries.

v. **Other programs in the institution**
NSC currently offers a Bachelor of Science in Business Administration degree (BSBA) and a BAS in Management; several of the courses required for the 3+1 program are offered as part of the BSBA or BAS-Management degrees as well. However, those degrees are broad-based management degree providing students with a background in a variety of aspects of business management; the BAS-ET provides very specific technical training in electronics, computer networking, or telecommunications technology. The program has been carefully crafted to ensure students receive the technical skills as well as the knowledge of organizational behavior and management principles needed to open career opportunities. Thus, the degree capitalizes on existing NSC courses but provides a unique degree path that no other degree at CSN or NSC offers.

vi. **Other related programs in the System**
The BAS-ET program provides a 4-year degree option for CSN's ET and CIT AAS students. Related NSHE programs include the BS in Electrical Engineering degrees at UNLV and UNR, which are designed for electronics and electrical design professionals with state-recognized credentials for registered engineers. However, those the BAS-ET is distinct. The AAS degrees that will feed into the BAS-ET do not prepare students for the rigorous demands of an

engineering degree, particularly in math and the natural sciences. Students in AAS degrees cannot transition successfully into an engineering program; they would lose the majority of their lower-division credits and for all intents and purposes would have to start from the beginning.

Great Basin College offers a BAS degree with four emphases: 1) Digital IT, 2) Instrumentation, 3) Land Surveying/Geomatics, and 4) Management in Technology. None of these emphases provide the upper-division technical courses in computer networking, electronics, or telecommunications that students will complete at CSN through the 3+1 program.

Western Nevada College offers a Bachelor of Technology degree in Construction Management, which again does not provide the technical training in the fields our proposed BAS-ET degree would.

F. Evaluation of need for the program

i. Intrinsic academic value of program within the discipline

Several statewide and regional studies have consistently indicated a need for technologists trained beyond the two-year level; employers seek skilled workers with managerial and soft skills specific to providing trianing and oversight to technology-based teams. These studies include ones by the Battelle Memorial Institute, commissioned by the Lieutenant Governor of Nevada; the Brookings Institute; National Science Foundation studies; and others.

In 2013 a formal needs assessment study, "CSN Engineering Technology Industry Demand Survey," was completed by RCG Economics, a local consulting firm, and UNLV's Cannon Survey Center. The study assessed local industry demand for skilled engineering technicians and technologists. Their findings, based on information from 123 Clark County business and industry respondents in charge of administration and/or hiring, indicated a growing need; in the final report, the authors state that "…many Nevada companies prefer hiring engineering technologists who are trained in applied research and practice relative to licensed engineers that are more theoretical-oriented. The same thing can be said regarding a Bachelor's degree in computer science verses the same degree in Engineering Technology" (p. 41).

This most recent study is consistent with findings of the prior studies mentioned above and indicate a need for the BAS-ET degree; 71.6% of respondents said recruiting graduates from a local four-year degree program would be "important" or "very important" for filling vacancies in their business (p. 27) due to their problem-solving and analytical abilities. CSN has also had requests from students for such a degree, dating back over two decades, as well as requests from ET and CIT department advisory committees and faculty and staff. The three proposed options (Computer Networking, Electronics, and Telecommunciations) were chosen based on these studies and feedback from stakeholders. The proposed BAS-ET degree will emphasize skills in critical thinking and problem-solving, communication, management and supervision, and business operations, all integral to economic diversification in Nevada.

ii. Evidence of existing or projected local, state, regional, national and/or international need for program

CSN's School of Advanced and Applied Technologies contracted with RCG Economics and the UNLV Cannon Survey Center to conduct an extensive survey of local industry employers to determine demand for the program. Over a third of respondents reported difficulty filling technical positions. When asked which positions are most difficult to fill, 38.6% identified engineering technologists, 15.9% said computer/networking technicians, and 6.8% said telecommunications technicians; these are all occupations related to the proposed BAS-ET

degree (p. 11). In the comments, one respondent said applicants "do not know how to integrate things in the big picture--they need more creative thinking skills…" (p. 14) while another noted "…we need people that have not only consulting experience but a business savvy that is not always aviable with people with technical training" (p. 15). Fully half (50.0%) of respondents noted that lack of communication and people skills was a common deficiency among applicants (p. 23). Our proposed program would help address these issues with the management, communication, and technical writing courses that are integrated into the degree along with the advanced technical courses.

iii. **If this or a similar program already exists within the System, what is the justification for this addition**
NSHE currently does not have any programs with the advanced technical coursework in computer networking, electronics, or telecommunications that will be required for this degree.

iv. **Evidence of employment opportunities for graduates (state and national)**
Employment projections from the Nevada Department of Employment, Training, and Rehabilitation (DETR) are presented below. Due to the variety of position titles in multiple industries, all disciplines reported below are potential career opportunities for graduates.

Statewide Occupational Employment Projections, 2012-2022

OCCUPATION	PROJECTED GROWTH
Electrical and Electronic Engineering Technicians	6.0%
Environmental Engineering Technicians	15.2%
Industrial Engineering Technicians	19.1%
Mechanical Engineering Technicians	11.7%
Engineering Technicians, Except Drafters, All Other	6.9%
Network and Computer Systems Administrators	16.0%

v. **Student clientele to be served (Explain how the student clientele is identified)**
The BAS-ET degree will primarily serve students who graduate with an AAS from select programs at CSN and then enroll in the 3+1 program through NSC. Students will be identified from the ranks of current and future AAS candidates at CSN, as well as the population of working technicians holding relevant Associate degrees from other regionally-accredited institutions.

G. **Detailed curriculum proposal**

i. **Representative course of study by year (options, courses to be used with/without modification; new courses to be developed)**
To best serve the needs of students in the program, courses will be offered in a variety of modalities, including face-to-face (days and evenings), online, and hybrid options. Some courses may be offered as accelerated sections.

All three options require students to first complete a relevant Associate's degree. The sequences of courses below cover the junior and senior years, when students would take courses specific to the 3+1 BAS-ET agreement that are beyond the requirements for an Associate's degree. All lower-division courses required for the 3+1 program are intended to strengthen students' general education background (for instance, more rigorous math and writing training) or to fulfill pre-requisites for upper-division courses.

1. BAS-ET Computer Networking Option

JUNIOR YEAR at CSN
Fall
ENG 102: Composition II
MATH 126: Pre-Calculus Math I or MATH 128: Pre-Calculus and Trigonometry
ACC 201: Financial Accounting
CSCO 480: CCNP ROUTE
ET 301: Customer Service Management

Spring
CIT 319: Managing Business Data Networks
CIT 363: Advanced Project and Earned Value Management
CSCO 482: CCNP SWITCH
MATH 127 (not required if student completes MATH 128)

Summer
CSCO 484: CCSNP TSHOOT

SENIOR YEAR at NSC
Fall
ENG 407A: Fundamentals of Business Writing
PHIL 311: Professional Ethics
MGT 301: Principles of Management and Organizational Behavior
Upper-division Humanities core course

Spring
MGT 494: Seminar in Management
COM 315: Small Group Communication or COM 434: Conflict Management & Negotiation
Upper-division Cultural Diversity core course
Upper-division Humanities core course

Summer

Upper-division elective

Degree Credits: 122-123

2. BAS-ET Telecommunications Option
JUNIOR YEAR at CSN
Fall
ENG 102: Composition II
MATH 126: Pre-Calculus Math I or MATH 128: Pre-Calculus and Trigonometry
ACC 201: Financial Accounting
ET 301: Customer Service Management
ET 389: Electronics Troubleshooting

Spring
CIT 363: Advanced Project and Earned Value Management
ET 410: Business Telecommunications
ET 420: Control Systems
MATH 127 (not required if student completes MATH 128)

Summer
ET 430: Electrical Power Systems
ET 494: Senior Project

SENIOR YEAR at NSC
Fall
ENG 407A: Fundamentals of Business Writing
MGT 301: Principles of Management and Organizational Behavior
Upper-division Humanities core course
Upper-division Cultural Diversity core course

Spring
COM 315: Small Group Communication or COM 434: Conflict Management & Negotiation
MGT 367: Human Resource Management
PHIL 311: Professional Ethics
Upper-division Humanities core course

Summer
Upper-division elective

Degree Credits: 125-126

3. BAS-ET Electronics Option
JUNIOR YEAR at CSN
Fall
ENG 102: Composition II
MATH 126: Pre-Calculus Math I or MATH 128: Pre-Calculus and Trigonometry
ACC 201: Financial Accounting
ET 301: Customer Service Management
ET 389: Electronics Troubleshooting

Spring
CIT 363: Advanced Project and Earned Value Management
ET 410: Business Telecommunications
ET 420: Control Systems
MATH 127 (not required if student completes MATH 128)

Summer
ET 430: Electrical Power Systems
ET 494: Senior Project

SENIOR YEAR at NSC
Fall
ENG 407A: Fundamentals of Business Writing
MGT 301: Principles of Management and Organizational Behavior
Upper-division Humanities core course
Upper-division Cultural Diversity core course

Spring
COM 315: Small Group Communication or COM 434: Conflict Management & Negotiation
MGT 367: Human Resource Management

PHIL 311: Professional Ethics
Upper-division Humanities core course

Summer
Upper-division elective
Upper-division elective

Degree Credits: 126-127

ii. **Program entrance requirements**
To enter the program, students must complete an AAS degree in Engineering Technology with an emphasis in Electronics, Telecommunications, or Computing and Information Technology, or receive approval of the corresponding department chair at CSN. Students transferring from another regionally-accredited institution with an AAS in Engineering Technology with similar emphases should be able to transfer most of their credits, but should check with CSN's School of Advanced and Applied Technologies counselors and department chairs.

iii. **Program completion requirements (credit hours, grade point average; subject matter distribution, preprogram requirements)**
Students must have a cumulative 2.0 GPA and a 2.0 overall NSC GPA. Students must earn a C- or higher in all major courses. Students must complete 30 upper-division credits in residence at NSC.

Below are the specific degree requirements for each option within the BAS-Engineering Technology degree. Students must complete an AAS before entering the program; the requirements for those degrees are not included here. The BAS requirements for the Telecommunications and Electronics options (#2 and #3 below) are identical; the BAS Computer Networking option (#1) is slightly different, requiring several CSCO-prefixed courses in place of the additional ET-prefixed courses for the other two options.

Because the AAS degrees that feed into the BAS-ET program may require more than 60 credits, the BAS programs are above 120 credits total even when students only complete 60 credits in their junior and senior years.

1. Major Requirements: BAS-ET Computer Networking (62 credits total)
• ACC 201 Financial Accounting
• CIT 319 Managing Business Data Networks
• CIT 363 Advanced Project and Earned Value Management
• COM 315 Small Group Communication OR 434 Conflict Management & Negotiation
• CSCO 480 CCNP ROUTE
• CSCO 482 CCNP SWITCH
• CSCO 484 CCSNP Troubleshooting
• ENG 102 Composition II
• ENG 407A Fundamentals of Business Writing
• ET 301 Customer Service Management
• MATH 128 Pre-Calculus and Trigonometry
• MGT 301 Principles of Management and Organizational Behavior
• MGT 367 Human Resource Management
• MGT 494 Seminar in Management
• PHIL 311 Profesional Ethics
• Upper-division electives (3 credits)
• Humanities and Cultural Diversity core (9 upper-division credits)

2. Major Requirements: BAS-ET Telecommunications (60 credits total)
- ACC 201 Financial Accounting
- CIT 363 Advanced Project and Earned Value Management
- COM 315 Small Group Communication OR 434 Conflict Management & Negotiation
- ENG 102 Composition II
- ENG 407A Fundamentals of Business Writing
- ET 301 Customer Service Management
- ET 389 Electronics Troubleshooting
- ET 410 Business Telecommunications
- ET 420 Control Systems
- ET 430 Eletrical Power Systems
- ET 494 Senior Project
- MATH 128 Pre-Calculus and Trigonometry
- MGT 301 Principles of Management and Organizational Behavior
- MGT 367 Human Resource Management
- PHIL 311 Profesional Ethics
- Upper-division electives (6 credits)
- Humanities and Cultural Diversity core (9 upper-division credits)

3. Major Requirements: BAS-ET Electronics (60 credits total)
- ACC 201 Financial Accounting
- CIT 363 Advanced Project and Earned Value Management
- COM 315 Small Group Communication OR 434 Conflict Management & Negotiation
- ENG 102 Composition II
- ENG 407A Fundamentals of Business Writing
- ET 301 Customer Service Management
- ET 389 Electronics Troubleshooting
- ET 410 Business Telecommunications
- ET 420 Control Systems
- ET 430 Eletrical Power Systems
- ET 494 Senior Project
- MATH 128 Pre-Calculus and Trigonometry
- MGT 301 Principles of Management and Organizational Behavior
- MGT 367 Human Resource Management
- PHIL 311 Profesional Ethics
- Upper-division electives (6 credits)
- Humanities and Cultural Diversity core (9 upper-division credits)

iv. **Accreditation consideration (organization (if any) which accredits program, requirements for accreditation, plan for attaining accreditation - include costs and time frame)**
The Accrediting Board for Engineering & Technology (ABET) is the principal source for program accreditation. The program will pursue ABET accreditation within 3 years of its establishment; the estimated cost is approximately $12,000.

v. **Evidence of approval by appropriate committees of the institution**
The proposal for a BAS in Engineering Technology was approved by:

1. Liberal Arts & Sciences Curriculum Committee on 12/1/14.
2. NSC Faculty Senate Curriculum Committee on 12/11/14.
3. NSC Faculty Senate on 2/2/15.
4. NSC Provost on 2/17/15.

H. Readiness to begin program

    i. Faculty strengths (specializations, teaching, research, and creative accomplishments
Faculty at CSN and NSC are ready and eager to offer the coursework required for the BAS-ET degree.

At CSN, one tenured professor recently completed a PhD in Electrical Engineering to be better prepared to teach for the program; another faculty member with engineering and business credentials, as well as experience in the defense electronics industry, was hired. All ET faculty at CSN have advanced electrical engineering degrees (Masters and PhD level); the Computing and Information Technology faculty have Master's, EdD, and/or PhD degrees with the exception of one faculty member with two bachelor's-level degrees. Part-time faculty have been offered by local electronics, manufacturing, computer networking, and defense contracting firms, as well as private technical consultants in the area.

The majority of courses taught in the senior year of the program at NSC will be taught by existing tenure-track faculty holding PhDs in their fields. These current faculty members earned degrees from highly-regarded doctoral programs and have experience in teaching and research.

Current NSC Business/Management faculty:
1. Wendi Benson, PhD in Experimental Industrial/Organizational Psychology, Washington State University
2. John Laurie, PhD in Economic Development, University of New Orleans
3. Richard Moore, PhD in Economics, Claremont Graduate University
4. Abby Peters, PhD in International Business, University of Texas-El Paso

    ii. Contribution of new program to department's existing programs (both graduate and undergraduate) and contribution to existing programs throughout the college or university
This program will provide a long-awaited pathway to a bachelor's-level degree for students in the related AAS programs at CSN. This 3+1 program will complement CSN's AAS degrees and provide an incentive for students to complete their AAS coursework so they can pursue a BAS in these high-demand fields.

The 3+1 BAS degree also complements programs at NSC, and overlaps with several requirements of our B.S in Business Administration and BAS-Management degrees. The management courses required for the BAS-ET are offered regularly since they are required for these other degrees as well, while the required communication course options are offered as part of the Communication minor. The BAS-ET will contribute additional enrollment to these courses while capitalizing on existing faculty and course offerings.

    iii. Completed prior planning for the development of the program (recent hires, plans for future hires, securing of space, curricular changes, and reallocation of faculty lines)
At CSN, recent hires include faculty with academic and industry experience in engineering, electronics, telecommunciations, and computer networking. CSN also added the needed upper-division technical courses to their catalog. In preparation to teach these courses, CSN has purchased radar equipment, add-on electronic warfare training modules, microwave trainers and microwave test equipment, Programmable Interace Controller (PIC) microcontroller trainers, data acquisition components, new computer networking equipment, and fiber optic fusion splicers.

NSC hired two new business faculty for the 2014-2015 academic year. The business faculty have been developing new course materials to ensure exceptional learning experiences in both online and face-to-face formats, including using classroom technologies to develop "flipped" classes so students spend more time discussing and applying knowledge in class while reviewing content online ahead of time. NSC is currently searching for a tenure-track accounting faculty member to join the business/management programs and a second tenure-track faculty member to teach communication classes.

iv. **Recommendations from prior program review and/or accreditation review teams**
In 2006, the Engineering Technology program at CSN was initially accredited by the Accrediting Board for Engineering and Technology (ABET); continuing accreditation was awarded in 2012. There are over 250 ABET-accredited Engineering Technology programs across the U.S., most with the same options our degree will provide. Most of these programs have 2+2 or other agreements that allow students with AAS degrees to pursue a bachelor's degree in the field.

v. **Organizational arrangements that must be made within the institution to accommodate the program**
CSN anticipates that a program director or lead faculty member would be assigned a partial workload of rougly 5 Instructional Units (IUs) to ad in the administration, maintenance, supervision, and fiscal operation of the program, as defined by CSN's Policy Statement on Department Criteria and corresponding Compensation Policy. The Compensation Policy is a formula model in which release time IUs are determined and assigned based on factors such as the existing number of the school's program directors, lead faculty, department chairs, and the funding allocation for the school.

Because the courses at NSC capitalize on courses available for existing programs within the Department of Social Sciences and Business Administration, we do not anticipate additional organizational arrangements in terms of directing the program. Admissions & Records will need to program in the degree requirements to waive select pre-requisite courses that we have agreed to waive for the 3+1 students; this is a fairly simple adjustment to make.

I. **Resource Analysis**

i. **Proposed source of funds (enrollment-generated state funds, reallocation of existing funds, grants, other state funds)**
Existing faculty will teach the courses for the first few years. If enrollment exceeds expectations and new faculty lines become necessary, additional funds will come from enrollment-generated state funds.

CSN anticipates that in-kind and monetary donations from business and industry partners and private donors, as well as grant funds, will supplement appropriated funds for purchasing equipment and materials for the advanced technical courses. Most supplies and materials will be covered by course lab fees. CSN and NSC will pursue grants from groups such as the National Science Foundation, Department of Education, Nevada Department of Employment, Training, and Rehabilitation, and the Carl Perkins Association for Career and Technical Education.

ii. **Each new program approved must be reviewed for adequate full-time equivalent (FTE) to support the program in the fifth year. Indicate if enrollments represent 1) students formally admitted to the program, 2) declared majors in the program, or 3) course enrollments in the program.**

a. **(1) Full-time equivalent (FTE) enrollment in the Fall semester of the first, third, and fifth year.**

    1st Fall semester <u>8</u>

    3rd Fall semester <u>12</u>

    5th Fall semester <u>15</u>

(2) Explain the methodology/assumptions used in determining projected FTE figures.
These projections are based on current part-time enrollment of students in relevant AAS programs at CSN. Discussions with student groups and local employers indicated higher levels of interest; we conservatively estimated that half of those who expressed an intent to enter the program in focus groups. The growth reported in the RCG Economics study shows a steady upward trend concurrent with these estimates.

b. **(1) Unduplicated headcount in the Fall semester of the first, third, and fifth year.**

    1st Fall semester <u>20</u>

    3rd Fall semester <u>30</u>

    5th Fall semester <u>40</u>

(2) Explain the methodology/assumptions used in determining projected headcount figures.
Estimates are based on input from various advisory groups at CSN. Although one employer pledged 20 students from them alone immediately upon the program's creation, we took a more conservative estimate. Discussions with student groups at CSN and local employers yielded numbers roughly double our estimates reported above.

iii. **Budget Projections – Complete and attach the Five-Year Budget Projection Table.**
See attached budget projection spreadsheet.

J. Facilities and equipment required

i. **Existing facilities: type of space required, number of assignable square feet, space utilization assumptions, special requirements, modifications, effect on present programs**
NSC and CSN provide exceptional facilities to serve the needs of students and faculty. At CSN, existing facilities include the dedicated Morse Arberry Jr. Telecommunications Building on the Cheyenne campus. The 82,000 square-foot facility celebrated its grand opening in 2004 and was specifically designed to accommodate Engineering Technology, Computing and Information Technology, and Media Technologies programs. The building has multiple "smart" classrooms; laboratories; a 202-seat "smart" auditorium with surround sound; a reinforced roof structure for antenna and transmission line design, construction, and measurement by telecommunications students; an IGT and Bally gaming lab with state-of-the-art slot machines, player tracking devices, and test equipment; a reading and writing lab; a green room for dignitaries to dress and prepare presentations; and a lobby showcasing Cisco Systems computer networking equipment used to conduct local, state, and national CCNA and CCNP certification courses.

NSC is already offering the courses required for the 3+1 agreement, so the demand on space should not change with the addition of this program. A number of classes in the BAS-ET program will be offered online, which alleviates demands on our existing space. All NSC students have access to computing facilities in several areas across campus as well as help desks for assistance with the online learning platform. The online format allows students to access course content remotely, using their personal computers or those available at public libraries and other sites.

ii. **Additional facilities required: number of assignable square feet, description of space required, special requirements, time sequence assumed for securing required space**
No additional facilities are required.

iii. **Existing and additional equipment required**
As noted above, the Morse Arberry Jr. Telecommunications Building is more than adequately equipped to provide BAS students with the essential equipment and materials required for the advanced technical courses that are part of the 3+1 program. Visitors from around the U.S. have toured CSN's facilities, including representatives from other institutions and the Chairman of the Board of Cisco Systems. Smart classrooms, labs, and storage space contain millions of dollars in state-of-the art equipment such as spectrum analyzers; frequency synthesizers; noise measurement devices; fiber optic fusion and mechanical splicers; optical time-domain reflectometers; soldering stations with ventilation; advanced computer networking equipment; central office T-carrier trunk circuit analyzers; central office channel banks; oscilloscopes; power supplies; function generators; DVOMs; radar and microwave equipment; various antennae designs, including a 72-foot crank-up tower; and amateur radio equipment. All of this equipment will be put to use in the technical courses taken during students' junior year. Much of it has been donated by business and industry partners, including IGT, Bally, Cisco Systems, Century Link, and JT3.

NSC prioritizes the provision of state-of-the-art resources to enhance the learning environment for students. Our "smart" classrooms feature a computing workstation, a projector, speakers, a document camera, Smartboard technologies, and interactive student response systems (iClickers). Every classroom on our campus is fully equipped in this fashion, which fully serves the instructional technology needs of the BAS-ET program. In addition, a lecture-capture system is installed in several rooms in the LAS building and will be available in the new Nursing, Education, and Science (NES) building slated to open in Summer 2015. This allows faculty to record themselves in the classroom; the videos can then be easily edited and posted online as video lectures in online or hybrid courses, or as study aids in face-to-face courses.

Since several BAS-ET major courses will be taught online, the transition of NSC from the WebCampus learning system to Instructure's Canvas system is particularly important. NSC moved to Canvas in Summer 2013. The ease of use and enhanced functionality provides an improved learning environment for students. Canvas syncs more easily with outside resources (such as Google Drive documents) and mobile apps, making it easier to integrate video lectures and other instructional materials that enliven courses.

Faculty development sessions, emails, and instructional videos from the department chair inform NSC faculty of available resources. Office computers can be equipped with programs such as Jing and Camtasia for creation and editing of video lectures. A limited number of campus laptops are also available for checkout, as needed. Departmental funds are available to cover specific instructional equipment or materials for courses at an instructor's request.

K. Student services required – Plans to provide student services, including advisement, to accommodate the program, including its implications for services to the rest of the student body

The BAS-ET program will create some additional responsibilities for student services at both CSN and NSC. Dedicated counselors have been assigned to CSN's School of Advanced and Applied Technologies; they will be trained and available to serve students of the program. Advisors from Student Affairs, Outreach Coordinators, Financial Aid advisors, the Registrar and associated staff, Student Support Services, Public Relations, Library Services, and other CSN entities will need to be trained and/or informed about the the 3+1 program and the sequences of courses students should take at CSN vs. NSC.

At NSC, students will be able to access advising through the existing Academic Advising Center (AAC); full-time faculty will serve as faculty advisors as well. A specific advisor at the AAC will be trained regarding the requirements of the program and will be assigned to BAS-ET students; the faculty assigned as advisors will be trained as well. The transfer coordinator, Admissions & Records staff, Financial Aid office, recruiters, and other relevant staff will also receive appropriate training to ensure they understand how the 3+1 program works and can effectively serve these students.

BAS-ET majors will have access to all services that are provided to undergraduates at NSC, such as the Student Academic Center, which provides free tutoring services, and the Career Services Center, which offers career advising (mock interviews, resume-writing workshops, etc.). We do not anticipate that adding the BAS-ET 3+1 degree will have any negative impacts on existing services for other students or programs.

L. Consultant Reports – If a consultant was hired to assist in the development of the program, please complete subsections A through C. A copy of the consultant's final report must be on record at the requesting institution.

i. Names, qualifications and affiliations of consultant(s) used

1. James Restrepo, RCG Economics

For 8 years, Mr. Restrepo was the Director of Financial Advisory Services in Las Vegas for Coopers & Lybrand LLP (now PricewaterhouseCoopers). Before joining Coopers & Lybrand in 1990, he managed the Las Vegas office of Mountain West Research, a regional economics firm based in Phoenix. Prior to that, he was the Chief Operating Officer of a 40-person regional planning and civil engineering firm based in New Orleans.

For 34 years, Mr. Restrepo has analyzed regional economic and real estate trends in a number of markets, including Nevada, Arizona, California, Texas, and the southeast U.S. His 25 years of urban economics experience has given him a broad range of skills and technical expertise in assessing the effects of local, regional, and national economic trends on urban economies and their real estate markets. His clients include some of the most promient private and public organizations in Nevada concerned with development and growth.

Affiliations:
Member, Board of NAIOP of Southern Nevada, 2008 president
Member, Government Affairs Committee, Metro Las Vegas Chamber of Commerce
Member, SNWA Integrated Resources Planning Committee
Member, Board of Vegas PBS
Former member (2008-2011) of the Nevada Economic Forum, Chariman for two years
Chair of Nevada Mining Oversight and Accountability Commission

2. UNLV Cannon Survey Center

The UNLV Cannon Survey Center is a supplier of high-quality, unbiased, accurate data analysis and assessment reports through telephone, online, face-to-face, and mail surveys for local, state, regional, national, and/or targeted populations. Staff members are experts in collecting and analyzing data, while maintaining scientific rigor and ethical oversight of the data collection process.

ii. Consultant's summary comments and recommendations
See attached RCG Economics report.

iii. Summary of proposer's response to consultants
N/A

M. Articulation Agreements

i. Articulation agreements were successfully completed with the following NSHE institutions. (Attach copies of agreements)
NSC & CSN have created articulation agreements between three AAS degrees at CSN and the three options in the BAS-ET degree (electronics, telecommunciations, and computer networking).

ii. Articulation agreements have not yet been established with the following NSHE institutions. (Indicate status)
N/A

iii. Articulation agreements are not applicable for the following institutions. (Indicate reasons)
N/A

N. Summary Statement

Nevada State College proposes to establish a Bachelor of Applied Science (BAS) degree in Engineering Technology as a 3+1 program in conjunction with CSN. Students would choose from one of three options for the degree: Computer Networking, Telecommunications, or Electronics. They would complete a relevant AAS degree at CSN, then complete additional credits at CSN during their junior year, including advanced technical coursework. They would finish the degree at NSC, taking courses in management, communication, and core curriculum areas.

The BAS-ET degree is distinct from engineering degrees such as those available at UNLV and UNR. Engineering degrees require more (and higher-level) courses in math, and have a stronger emphasis in theory; the BAS-ET program focuses on application, and preparing students for careers implementing the plans and designs created by engineers. Engineering and engineering technology programs are accredited by separate commissions using different accreditation criteria.

The proposed program provides students with the advanced technical training they need for careers in engineering technology, as well as the management knowledge and "soft skills" employers seek for supervisory positions. The design of the degree is in line with the knowledge and skills local business and industry stakeholders have identified as essential for future employees. In fact, local industry partners are sufficiently eager to have employees with additional training beyond the associate's level that some have expressed interest in paying the tuition for their employees who enter the program. NSC and CSN will follow up with these potential options.

The BAS-ET will provide a 4-year degree option for students who otherwise do not have a path to a baccalaureate degree after receiving an AAS degree; it will do so while meeting the needs of local business and industry and capitalizing on the strengths and missions of NSC and CSN through the

design of the 3+1 agreement. Both institutions are excited at the opportunity to work together to offer educational opportunities that will allow them to take jobs that are currently going to individuals outside the state.

Institution: NSC   Program: BAS-Engineering Technology   Semester of Implementation: Fall 2015

DIRECTIONS: Complete the following cost estimates for the first, third, and fifth year budget projections for the proposed new program in Section A. Costs for the third and fifth year are cumulative. If the total budget for the program is not reflected in the "Existing" or "New" categories, please provide further explanation in the space provided below (EXPLANATION). Any "new" costs must be noted by source in Section B.

STUDENT FTE   Year 1: 8   Year 3: 12   Year 5: 15

Section A.	Year 1/Start-up				Year 3				Year 5			
	Existing[1]	New[2]	Total	FTE	Existing[1]	New[2]	Total	FTE	Existing[1]	New[2]	Total	FTE
PERSONNEL												
Faculty (*salaries/benefits*)[3]	210,414	0	210,414	3.0	217,464	0	217,464	3.0	224,514	0	224,514	3.0
Graduate Assistants	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Support Staff	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Fellowships/Scholarships	0	0	0	0.0	0	0	0	0.0	0	0	0	0.0
Personnel Total	$210,414	$0	$210,414	3.0	$217,464	$0	$217,464	3.0	$224,514	$0	$224,514	3.0
OTHER RESOURCES												
Library Materials (*printed*)	0	0	0		0	0	0		0	0	0	
Library Materials (*electronic*)	0	0	0		0	0	0		0	0	0	
Supplies/Operating Expenses	0	0	0		0	0	0		0	0	0	
Equipment	0	0	0		0	0	0		0	0	0	
Other Expenses	0	0	0		0	0	0		0	0	0	
Other Resources Total	$0	$0	$0		$0	$0	$0		$0	$0	$0	
PHYSICAL FACILITIES												
Construction	0	0	0		0	0	0		0	0	0	
Major Renovation	0	0	0		0	0	0		0	0	0	
Other Facility-Related Expenses	0	0	0		0	0	0		0	0	0	
Physical Facilities Total	$0	$0	$0		$0	$0	$0		$0	$0	$0	
TOTAL	$210,414	$0	$210,414		$217,464	$0	$217,464		$224,514	$0	$224,514	

Section B.	Amount	%			Amount	%			Amount	%	
EXPLANATION OF "NEW" SOURCES[2]											
State Support	0				0				0		
Federal Grants/Contracts	0				0				0		
State Grants/Contracts	0				0				0		
Private Grants/Contracts	0				0				0		
Private Gifts	0				0				0		
Other (*please specify*)	0				0				0		
TOTAL	$0	0.0%			$0	0.0%			$0	0.0%	

[1]Resources re-allocated from existing programs in Year 1 should be noted in the "Existing" column. In addition, "New" costs from Year 1 that will continue in the third and fifth year should also be noted in the third and fifth year as "Exisitng."

[2]Any "New" resource utilized to fund a new program must include the source to be provided in the "Explanation of New Sources" section. Total "New" sources for each year must equal the total for each year under "Explanation of New Sources."

[3]Budget estimates for faculty salaries and benefits must include estimated merit and COLA increases in Year 3 and Year 5.

EXPLANATION (*Please provide any additional information pertinent to the budget projection, including for example, explain for any new funding sources that are not guarnateed receipt by the institutions how the program will make-up for the potential loss in expected new funding.*):

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