BCC

Bellevue Community College

Bachelor of Applied Science in Radiation and Imaging Sciences

Presentation to the
HECB Education Subcommittee
June 20, 2006

Degree Description

The BAS in Radiation and Imaging Sciences will prepare certified technologists with management and advanced technical skills for career and salary advancement.

Two concentrations will be offered:

- **Radiation and Imaging Management**
  preparation for management or supervision in radiation and imaging departments.
- **Radiation and Imaging Technology**
  preparation for career advancement through advanced imaging knowledge, skills, and certification.

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Since Last Meeting

Attention was given to four areas in response to HEC Board Education Committee questions:

- Enrollment Planning/ Sustainability
- Budget Review
- Accreditation Planning
- Master Degree Pathway

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Enrollment Planning

Questions: Is there sufficient enrollment? Is enrollment optimal? Is enrollment sustainable?

Survey data from multiple sources show:

- Current enrollment is conservative; well-sized for a new program.
- Long-term and sustained demand.
- Potential for new concentrations in emerging fields and related specialties.

Challenge: Predicting enrollment patterns

- Refined planning assumptions.
- Developed planning scenarios.
- Matched resources to planning models.
- Anticipate more refinement as we poll potential students on preferences.

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Budget Review

Question: Funding versus Program Costs

Priorities:

- **Matching enrollment patterns with FTEF/sections to allow for maximum student progression.**
- **Highly credentialed personnel w/ terminal degrees.**
- **Instructional resources.**
- **Clinical experience.**
- **Facilities, equipment, libraries.**
- **Student services.**
- **Development and scholarship.**

With More funding

- **More full-time faculty.**
- **More development and scholarship opportunities.**
- **More instructional resources.**

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Accreditation-- Focuses

Transformational impact on college. Same requirements as other baccalaureate granting institutions.

BCC will pay special attention to **quality dimensions**:

- **Faculty Credentials/ Scholarship.**
- **Faculty Workload Expectations/ Pay.**
- **Degree Structure, Program Content, General Education Requirements (integration and increasing sophistication and rigor over all four years), Student Learning Assessment.**
- **Facilities and Equipment, including library.**
- **Student Services, Admission and Records.**
- **Mission and Goals.**
- **Governance.**

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Jim Sultan
advising & counseling
changes?
JF - advising for new prog
- artic agreements w/ other
CTCs
- transcript evaluation

Accreditation -- Background

- BCC just completed *10-year evaluation.*
- Received *10 major commendations* in planning, institutional effectiveness, programmatic innovation, general education and its assessment
- Have evaluator background for *four-year colleges.*
- BCC has *researched accreditation challenges and best practice* suggestions identified by most 2-year colleges that have begun to offer 4-year degrees. There is remarkable consistency in the areas of interest in which we will focus planning and attention.

Accreditation-- Process

- Substantive Change Request – Summer 2006
- Response from NCCU – Fall 2006
- Candidacy Begins– Fall 2006
- *First Class – Fall 2007*
- Self-Study Begins – Fall 2007
- *First Class Graduation – 2009*
- Self-Study Filed 2009-2010
- Visit – 2010
- Determination of Commission --2010

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Master Pathways

Agreement with University of Washington

BAS graduates will be prepared for admission at the University of Washington School of Public Health and Community Medicine to their master of public health or master of health administrations programs, enabling BAS students further educational and career advancement .

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Conclusion

- Well-documented and sustained demand for the program with *no other programs in the state.*
- Integrated four-year program that develops sophistication and rigor in program content and general education.
- Strengthens college's mission to serve community.
- Strong, enduring ties with R & I clinical partners.
- Dedicated faculty with years of experience and required professional credentials.
- College-wide commitment with proven track-record in creating, executing and maintaining new programs.

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Bellevue Community College

Principle: ***Service to Placebound Students***:	
Criteria 1.A	**Standards**
Program fills a gap in options available for students because it is not offered by a public four-year institution of higher education in the college's geographic area.	**Requirement**: No public baccalaureate institution offers degrees like this one serving the placebound graduates of relevant applied associate degree programs in the college's geographic area.

Good – no degree in area or state

Principle: ***Service to Placebound Students***:	
Criteria 1.B	**Standards**
Demonstrate demand for the proposed program from a sufficient number of students within its service area to make the program cost-effective and feasible to operate.	**Requirement**: Provide evidence that the number of students graduating from relevant applied associate degree programs in the catchment-area result in sufficient students going on for the BAS each year to match the planned junior year FTE request

Good – considerable student demand

Principle: ***Service to Placebound Students***:	
Criteria 1.C	**Standards**
If applicable, has a plan for program articulation with nearby colleges.	**Requirement**: Indicate why articulation is or is not applicable. If applicable, describe articulation plans and the number of student expected from nearby colleges.

Okay – many other programs do not currently include the same general education classes (college-level math for example). This articulation issue could be better addressed. The lack of general education courses will extend the credits needed to the degree.

Principle: ***Part of Workforce Mission***	
Criteria 2.A	**Standards**
The college can demonstrate that employers demand the level of technical training proposed within the program, making it cost-effective for students to seek the degree.	**Requirement**: Based on the data sources described document either that statewide demand in the proposed occupational area substantially exceeds current statewide supply, **or** local demand substantially exceeds local supply.

Good – significant job gap in region and state, some concern regarding the two options in the degree and whether the industry demand is equal for both.

Principle: ***Part of Workforce Mission***	
Criteria 2.B	**Standards**
Has a plan for development of the curriculum that represents a level of rigor and knowledge above the level of the related applied associate degree.	**Requirement**: Describe the curriculum (both the portion expected from the applied associate level and the portions at the upper division level).substantially exceeds local supply.

Mixed fit curriculum well to industry focus group results. Need to think through the general education courses that are specific to the field of study – e.g. Medical Ethnics – may or may not meet accreditation requirements, need to address general education from an educational outcomes perspective, some concern if the management option is sufficiently comprehensive.–

Principle: Capacity & Sustainability	
Criteria 3.A	**Standards**
Demonstrates the capacity to make a long-term commitment of resources to build and sustain a high quality program.	**Requirement**: Provide a financial plan (costs, expenditures and revenue streams to support the proposal) and a description of adequacy of facilities, equipment and other instructional resources required by the bachelor's program.

OK – have equipment, good partnership support from industry

Principle: Capacity & Sustainability	
Criteria 3.B	**Standards**
Has analyzed the faculty/staff needed, the education and professional experience qualification of faculty members relative to teaching assignments and anticipated sources of qualified faculty and staff.	**Requirement**: What kind of staff needed

OK – analyzed staff needs carefully

Principle: Capacity & Sustainability	
Criteria 3.C	**Standards**
Has or can readily engage faculty appropriately qualified to develop and deliver a high quality curriculum at the baccalaureate level.	**Requirement**: by fall 2007, the current faculty reassigned to the program, plus the faculty hired using the new FTE funding, will have the background consistent with the above analysis plus recent work experience in the field (minimum of two years at a job appropriate for those with at least the

	bachelor's degree).

Good – have strong faculty and plans for additional faculty.

Principle: Maintain 2-Year Focus	
Criteria 4.A	**Standards**
Has an adequate and appropriate student services plan.	**Requirement**: Describe plan

Good plan

Principle: Maintain 2-Year Focus	
Criteria 4.B	**Standards**
Has a plan for the assessment of student achievement and program assessment at the bachelor's level built upon a track record of effective assessment of the associate degrees.	**Requirement**: Describe plan

Good - pre-post approach well regarded

Principle: Open Door	
Criteria 5.A	**Standards**
Has a plan for selective admissions processes, if used for the bachelor's program, consistent with an open door institution.	**Requirement**: Describe admissions approach

Good–asking the right questions, the plan is still clearly in process of being developed, clear requirements and plan for transfers from other institutions.

Bellevue Community College – Radiation and Imaging Science

Principle: Part of Workforce Mission	
Criteria 2.A	**Standards**
The college can demonstrate that employers demand the level of technical training proposed within the program, making it cost-effective for students to seek the degree.	**Requirement**: Based on the data sources described, document either that state-wide demand in the proposed occupational area substantially exceeds current state-wide supply, or local demand substantially exceeds local supply. **For a stronger proposal**: Document a supply-demand gap at both the state level and in the local region.

Bellevue Community College conducted extensive research to validate the industry demand for the proposed Radiation and Imaging Sciences BAS program. Sources included (1) national and regional Bureau of Labor Statistics reports; (2) professional organization studies; (3) Washington Higher Education Coordinating Board reports; and (4) Workforce Training and Education Coordinating Board reports. Moreover BCC conducted extensive research in addition to a large employer survey and an industry focus group conducted by BCC to validate need for the program. All sources presented in this section and the appendices contribute to forming a picture of a strong and sustained demand for graduates from the proposed Radiation and Imaging Sciences program.

Industry Demand for Technologists to Have a Bachelor's Degree

Because the fields of radiation and imaging are becoming increasingly more complicated, requiring greater independent decision-making, critical-thinking skills, understanding of more complex technologies and more rigorous health care regulations, the American Society of Radiologic Technologists (ASRT) and hospitals and clinics nation-wide are calling for the bachelor's degree to become the entry-level degree in the field. In 1999, the ASRT passed a resolution that is expected to become the industry standard, supporting the bachelor's degree as the entry-level degree. (ASRT 1999, www.asrt.org/media/pdf/whitepaper.pdf)

Based on the 2005 HECB *Analysis of Training Levels by Occupation* report, it is estimated that out of the projected 140 annual job openings in the fields of radiation and imaging technologies, 33 positions (or 24 percent) will require a BA degree and six will require a master's degree.[5]

In addition there is a rapid push for increased technology skills and knowledge for these professions that go beyond the scope of a two-year degree. In its *2004-05*

[5] May 2005Washington State Occupational Forecast with HECB Analysis of Training Levels by Occupation; http://www.hecb.wa.gov/autheval/dpr/documents/occupationandedtables.xls

Occupational Outlook Handbook, the U.S. Department of Labor Bureau of Labor Statistics[6] sites a number of factors:

- Radiologic technologists who also are experienced in more complex diagnostic imaging procedures, such as CT or MRI, will have better employment opportunities, as employers seek to control costs by using multi-skilled employees.
- Sonographic technology is expected to evolve rapidly and to spawn many new sonography procedures, such as 3D-sonography for use in obstetric and ophthalmologic diagnosis.
- Bringing together into one machine or one procedure technologies that used to be separate is another major trend. Examples include PET/CT scanners enabling doctors to more accurately detect cancer and pinpoint its exact location. This trend will increasingly require technologists to be cross-trained on multiple equipment and modalities.

Local and Regional Employer Demand

Health care employers, professional societies and community organizations throughout the state support the proposed bachelor's program and have written letters of support and endorsement indicating their need for supervisors/managers and advanced radiation and imaging professionals with bachelor's degrees (Appendix 7).

BCC Employer Survey

BCC sent the employer survey to 48 radiology administrators at hospitals and large imaging centers in the Puget Sound region; 36 surveys were returned. Although employers indicated that bachelor's or higher degrees are currently not required until one is applying for an upper-level management position, they emphasized that they would prefer bachelor's degrees in applicants for mid-level management positions. Half of those surveyed believe there are not enough people with bachelor degrees in Washington to meet the needs of their organizations. Employers see the biggest barrier to moving people into supervisory and leadership positions is finding the time to train them in the specific management skills for the radiation and imaging field. Other results of the employer survey can be summarized as follows:

- 83 percent indicated that they would hire graduates of a bachelor's degree program in radiologic sciences.
- 78 percent indicated they would encourage their employees to pursue such a degree.
- 75 percent would offer tuition reimbursement and other incentives to pursue the degree.

BCC Employer Focus Group

BCC conducted a focus group in June 2005 with eight individuals in supervisory and management positions in radiology, nuclear medicine, and radiation therapy. The group

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[6] The Personnel Crunch: A Crisis in the Radiologic Technology Work Force, American Society of Radiologic Technologists, 2001

was diverse with education ranging from those who acquired their skills from on-the-job training to individuals possessing MBA degrees. Participants included representatives from medical centers and clinics in both non-profit and for-profit sectors. Their views mirrored those of other hiring surveyed officials. Specifically, the focus group identified the following industry trends:

- An increasing number of jobs require a minimum bachelor's degree education, and a bachelor's degree will eventually be required for all supervisory positions.
- More education in new technology areas will be essential.
- More complex management skills will be required of people in supervisory positions.
- A bachelor's degree equates to a salary increase in most positions.
- Technologists in supervisory positions have increased responsibilities and would benefit from specific radiation and imaging health care-related management education.

General Regional Trends that Impact the Radiation and Imaging Technology Professions

Washington State Outlook

State and Regional Needs Assessment
The Washington Higher Education Coordinating Board (HECB) states the following in the September 2005 State and Regional Needs Assessment report[7]:

- State, regional, and community assessments indicate a need for increased capacity in . . . health care.
- The state should reverse the trend of the past three years, when the number of graduate degrees declined in . . . health, which are all important fields from the perspective of the state's employers.
- Washington is unique in that we are a leader in innovation and technology-based industries; however, that leadership position has relied heavily on drawing highly trained workers from outside of Washington, especially in . . . and health care occupations.
- Health care practitioners . . . stand out as an area where a substantial number of workers enter the occupation with a bachelor's or complete a bachelor's while working.
- Training needs in health care are significant at all levels. . . .

A recent report from the health care personnel shortage task force indicates high levels of need and difficulty hiring qualified workers in a wide range of health care occupations at all educational levels.[8]

Washington State Job Vacancy Survey
Examination of the *Washington State Job Vacancy Survey* for April-May 2005[9] revealed three relevant facts concerning the lack of sufficient working health care technologists:

- With an estimated 14,195 job openings, health care had more than twice as many openings as any other industry in April-May 2005.
- Health care practitioners and technical occupations accounted for the largest share of vacancies in April-May 2005 (8,918 vacancies, or 13 percent of all vacancies)
- Health care practitioners and technical occupations had the highest percentage of permanent openings (99 percent), and reported the highest percentage of openings requiring certification/licensing (90 percent).

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[7] State and Regional Needs Assessment. Washington Higher Education Coordinating Board, September 2005.
[8] Progress 2004: A Report of the Health Care Personnel Shortage Task Force. Workforce Training and Education Coordinating Board, December 2004; http://www.wtb.wa.gov/HCRPT05.PDF
[9] Washington State Job Vacancy Survey. Washington State Department of Employment Security, July 2005; http://www.workforceexplorer.com/admin/uploadedPublications/5159_JVSApr-May_05.pdf

Washington State Board of Community and Technical Colleges Baccalaureate Capacity Study
The 2004 baccalaureate capacity study conducted by the Washington State Board of Community and Technical Colleges reported the following findings:

- Technicians moving from their specialty into management and those planning to work at a more advanced level in their professional/technical specialty need education beyond their initial associate degree. Industry representatives favor development of additional applied baccalaureate degrees in both management and professional technical specialization.
- The study documents the need for 3,000 additional FTE at the junior and senior level to meet this current and future demand to 2010 for baccalaureate degree options for technical degree graduates. This demand will not be met entirely by the growth already planned in institutions currently grantors of baccalaureate degrees.
- Community or technical college bachelor's degrees are a valid alternative used in other states for meeting some of the need such a BAS in Radiologic Technology or a Technology Management degree.[10]

King County Outlook

The Workforce Development Council of King County (WDC)[11] has reported broadly on the field of health care and its projected growth within the county. The WDC identified health care as one of the largest employment sectors in Washington state. Hospitals alone employ over 75,000 people - more than Boeing, Microsoft, or Safeway.[12] Employment growth in the industry is expected to continue, creating over 10,000 new health care jobs in Seattle-King County alone by 2012. Of these 10,000 new jobs, nearly 60 percent are expected to be in professional/technical classifications.[13] In 2004, employers reported over 8,000 job vacancies for health care practitioners and support personnel.[14]

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[10] Baccalaureate Capacity Study Findings and Recommendations. Washington State Board of Community and Technical Colleges, January 2005; http://www.sbctc.ctc.edu/education/default.asp
[11] Sector Analysis: Health Care. Workforce Development Council of Seattle-King County, 2005; http://www.seakingwdc.org/Templates/be_secini_hc.html
[12] The Business of Caring. Washington State Hospital Association, 2004.
[13] Economic Contribution of the Health Care Industry to the City of Seattle. June 2004.
[14] Progress 2004, Health Care Personnel Shortage Task Force. December 2004.

Bellevue Community College

Please address the following questions raised by the Evaluation Committee in two ways:

- Focus your March 6 presentation on these questions and request for more information.
- Provide a focused written response to the question not later than February 23. You may want to include web links, as in the RFP document. Email the responses to Jackie Eppler-Clark at SBCTC **JClark@SBCTC.ctc.edu** by 3 pm, February 23.

Principle: ***Part of Workforce Mission***	
Criteria 2.B	**Standards**
Has a plan for development of the curriculum that represents a level of rigor and knowledge above the level of the related applied associate degree.	**Requirement**: Describe the curriculum (both the portion expected from the applied associate level and the portions at the upper division level).substantially exceeds local supply.

- **The degree title suggests a focus on advanced radiologic technology and related imaging sciences, but the curriculum contains only one course HCMGMT 301) related to imaging science for students with the management concentration (about half the students). Explain the relationship between the degree title and the focus for half the students on what appears to be a broader field of study – health care management.**

The degree title, radiation and imaging sciences, was intentionally chosen as a broad designation to encompass the four closely related disciplines of radiologic technology, diagnostic ultrasound, radiation therapy and nuclear medicine. The degree is an applied science degree that is designed to increase *both* the technical competence and focused management skills of all students in the program; the two concentrations teach both sets of skills, only in different proportions. Because there is such a great demand for department supervisors and managers in these disciplines, it is common practice for radiology and imaging bachelor programs throughout the country to offer courses that will prepare technologists to be both managers and advanced technologists. For example, Idaho State University requires courses ranging from Principles of Accounting, to Organizational Behavior in Health Care and Human Resource Management in Health Care Organizations in addition to a full complement of applied technology courses. The tracks in the BCC program were developed as a direct response to feedback from the focus group and survey respondents. They asked for a degree that would both

- provide an overview of management principles to the people learning to become "super" technologists so that they could perform their jobs more effectively, and
- broaden the technical expertise of people learning to become radiation and imaging clinical managers and supervisors so that they could understand and supervise the emerging technologies being used in their clinics.

The technologies in these disciplines are beginning to merge together to form new kinds of diagnostic and treatment tools, so it is critical for both managers and advanced technologists to have an understanding of these related fields.

In rereading the proposal, it appears the term "electives" could have created some confusion for the reader. The word was meant to connote that students have some flexibility in selecting from among the designated core courses offered. Every student in the management concentration is required to take 15 credits of advanced technology courses (ARIT) from among the 72 credits offered. These will increase the breadth and depth of the student's technical competence and provide a basis to better manage the technical, regulatory and personnel issues of the job. The management course HCMGMT 301 includes essential components of the specialty areas which a graduate may supervise after gaining a management position. This is not a competency based course (practical application), but it is designed to educate a manager in the complexities of that specialty relative to managing the area.

Although the management concentration uses the broad title "health care management" the focus of the courses and the case studies used will be from the context of radiation and imaging. The faculty and administrators working on the program originally considered the title, "radiation and imaging management", but there was concern that there might be confusion between that and the advanced radiation and imaging technology concentration. The health care management concentration is designed for people who have a radiation and imaging background and want to become managers of their departments or clinics. The management curriculum was developed to address the needs expressed by technologists in the field as well as hospitals and clinics for supervisors and managers in radiation and imaging clinics who possess both specific expertise in their field combined with management knowledge. The course of study is different than one for a student who works toward a traditional degree in health services administration. The BAS in Radiation and Imaging Sciences with the health care management concentration allows the student to prepare for a management role in a radiology department while strengthening his or her clinical background; this program puts the focus on management within the context of a radiology department.

- **Will graduates of each of the AAS-T degrees and the one certificate program listed on the cover page (Radiologic Technology Diagnostic Ultrasound, Radiation Therapy and Nuclear Medicine) be equally prepared to successfully undertake all of the required ARIT courses listed in the curriculum? Explain how these required courses be of equal use related to the career ladder for each technical field feeding into the BAS.**

Irrespective of where a student has received his or her training, the prerequisites to acceptance into the program requires that all entering BAS students have had human anatomy and physiology, an understanding of pathology relevant to their entry-level training, and quality assurance as it applies to that field. In addition, all entering students will have demonstrated a level of knowledge appropriate to their field, based on having passed a national certification examination. Preparation for certification, whether through an associate degree program, certificate program, or hospital-based program of study gives the students a rigorous grounding in similar kinds of courses, such as pathophysiology, first-year college physics or radiology-based physics, and cross-sectional anatomy.

The students' underlying academic and technical background has prepared them to move into the advanced imaging technologies offered in the third and fourth years of the program. The four

courses identified as requirements for the ARIT concentration will give the student the advanced core content that is necessary to take the other advanced ARIT courses. The required ARIT courses in cross-sectional anatomy and pathophysiology look more broadly at these topics, using examples from all of the imaging modalities and showing how the different modalities provide complementary answers to clinical questions. ARIT 410 moves from instrument-specific quality control issues to the perspectives of departmental and hospital quality assurance. It is not expected that every student will have the background knowledge to take every ARIT course; rather students will select from among 19 diverse elective ARIT courses for advanced education that augments their specialty field or broadens their knowledge into a related discipline. Advising sheets to be designed during the planning year completed with the assistance of a faculty advisor will help students select courses that fulfill their personal goals.

The BAS program expands the depth and breadth of the students' understanding – it teaches them foundational concepts in fields beyond their own; gives them more versatility in the kinds of procedures they can perform and offers a greater insight into the interrelationship of the technologies. As these four disciplines have become more closely related to each other, and technologists work more closely together to provide patient care, taking a course in a related discipline can be extremely helpful. For example, radiation therapists work closely with all the imaging specialties to determine the location of a patient's cancer. Another example is the combining of radiologic and nuclear medicine studies (computed tomography (CT) and positron emission tomography (PET) scans that are fused).

The broad range of ARIT courses offered will provide an opportunity for bachelor's program students to choose a pathway of courses that will prepare them for advancement within their profession as well as provide opportunity for cross training from profession to profession, as in the examples, above. Specific advanced courses combined with certification will allow an individual to pursue many different avenues, such as vascular intervention, specialized ultrasound, magnetic resonance imaging (MRI), computed tomography scanning (CT)), interventional radiology (IR), and nuclear cardiology technology (NCT). (See http://www.arrt.org/web/content.jsp?include=/examinations/examlist.htm for additional examples.) In addition, as these fields are becoming more integrated, there are new prospects for technologists who have the crossover knowledge gained from a bachelor's program like this one to become leaders in their field. The opportunities for graduates lie in expanding their knowledge into the new and merging technologies that are creating innovative pathways in patient care and diagnosis.

- **Summarize the information in Appendix 10 related to the general education requirements that BAS graduates will have completed either in their applied associate degrees or in the junior or senior year indicating especially the natural science general education courses. Credits in natural science are not shown in the core curriculum on page 12. Please indicate the total credits in each general education area. You might provide a table as follows:**

BCC graduates as well as students entering the BAS program from outside of BCC will satisfy the applied associate degree general education requirements through required prerequisites to enter the program.

General Education Courses and Credits

Area	Prerequisite requirements	Taken in the junior or senior year
Communications	5 credits (English comp)	5 credits (Research Paper)
Quantitative Reasoning	5 credits (Intermediate Algebra)	10 credits (Statistics, General Business)
Natural Science (Science and Environment at BCC)	10-12 credits (anatomy and physiology) + 75 or more credits from associate applied science field	5 credits minimum*
Humanities	5 credits (not specified)	5 credits (Intercultural Communications)
Social Science	5 credits (not specified)	10 credits (Medical Ethics, Economics of Health Care)
Others if required by the college		Cultural diversity (Intercultural Communications)

* Based on the college's existing general education plan students in both concentrations will take a science course from among the 26 different applied technology courses shown in the original proposal as Appendix 9 that will fulfill this general education requirement. During the planning year staff working out the final details of the degree will seek guidance and counsel from the BCC General Education Council to develop upper division general education requirements, develop rubrics for those requirements and seek approval for courses that will meet them.

- **You indicate that feedback from the employer survey and focus groups factored into the design of the degree – specifically that the courses in management are targeted to health management, rather than general management. Please provide more information on the changes based on the employer input.**

The surveys and, in particular, the focus group provided very specific feedback that influenced the design of the courses offered in the health care management concentration of the degree. The kinds of skills and knowledge they requested be included is specific to the health care industry and particularly the radiation therapy and imaging field. Employers found that people who enter the health care profession with a general business management degree are at a disadvantage, because they lack necessary industry-specific knowledge and require much more on-the-job training. The employers emphatically identified that the management courses should utilize diagnostic imaging and therapy examples because specific accreditations, governmental regulations, and medical ethics influence management in this field. Specifically, employers asked that the BAS courses cover topics such as

- Statistics – to help managers understand the meaning of various statistics, like clinical outcomes;
- Medical quality assurance and accreditation issues – to help meet stringent health care regulations required by the Joint Commission on Accreditation of Healthcare Organizations

(JCAHO), the Intersocietal Commission for the Accreditation of Nuclear Medicine Laboratories (ICANL), American College of Radiology (ACR), etc.;

- Medical ethics issues – to provide understanding of legal and ethical issues like the Stark law and the Health Insurance Portability and Accountability Act (HIPAA);
- Procedure reimbursement and coding issues – to help clinicians and managers understand the complicated rules for ensuring payment in areas such as mammography and x-ray diagnostic procedures; and,
- Characteristics and dynamics of healthcare teams – to help new managers understand collaboration, work flow and information sharing across multiple units to coordinate patient care management.

Two specific courses that were created in response to this feedback were the courses on Information and Image Management and HCMGMT 460, Management and Leadership. These and some of the general education courses, for example, Medical Ethics and the Economics of Health Care will use health care examples and case studies in the presentation of materials, as requested by participants in the focus group, to help students apply the concepts to what they will practice in clinical settings.

- **Provide additional information on the distance learning plan related to the curriculum outlined.**

The college's goal is to be able to deliver its curriculum statewide to students who are unable to come to the campus to take courses. BCC has performed the preliminary research to ensure that it can offer its complete curriculum at a distance and has experience offering courses in the radiology associate degree programs online. The college has a digital database of radiologic images that will facilitate the transformation of the curriculum to distance formats. The program budget includes development of all courses for a distance learning format; room rental and site coordination for four remote locations; and technology for synchronous on-line learning.

During years 1 and 2 the college plans to deliver courses using a hybrid approach including live instruction through the K-12 ITV system and asynchronous online instruction. The asynchronous portion, which will be available to students at any time from any computer, will utilize BCC's full-enterprise online courseware, WEBCT-Vista, and will contain all course materials and content and facilitate group discussions. In addition, the college will offer live instruction and class interaction through the K-12 ITV system at four remote sites throughout the state. Students would travel to one of the sites once or twice a week and complete the remaining coursework in an online format at their convenience. A coordinator will be on site to attend to students' needs. Beginning in the third year, the college expects to deliver courses using a combination of live synchronous (real-time) web-based instruction and asynchronous online instruction. Students would attend live class sessions at their computer desktop 1-2 times per week and complete the remaining coursework in an online format at their convenience.

The final plan for staging (which courses will be introduced in what year) the courses at a distance will be developed during the planning year. A new partnership between the BCC radiologic technology associate degree program and Columbia Basin College will provide immediate funding and a remote site for synchronous instruction, so it may be possible to begin

synchronous web-based instruction earlier than the third year of the program. BCC is fortunate to have clinical partners throughout the state where advanced imaging instruction can occur, which will allow a student to take part of the course online and part at a clinical site.

Principle: Capacity & Sustainability	
Criteria 3.A	**Standards**
Demonstrates the capacity to make a long-term commitment of resources to build and sustain a high quality program.	**Requirement**: Provide a financial plan (costs, expenditures and revenue streams to support the proposal) and a description of adequacy of facilities, equipment and other instructional resources required by the bachelor's program.

- **Regarding you library instruction and resources: Explain how the EWU resources combined with your own additional funding will meet the programmatic and accreditation requirement to provide library instruction and resources at the bachelor's level.**

The complete EWU collection is available to all BCC students via a 24-hour turn-around interlibrary loan program. This will give BCC baccalaureate students with complete access to a library from an accredited four-year university that will provide depth and breadth in all general education and elective fields. Students have the ability to search the EWU library database through computers at BCC and place their request which is delivered to the BCC library within 24 hours. Since EWU has a four-year degree in health services administration, students will also gain access to some additional healthcare management books, periodicals, and media resources that will augment BCC's holdings.

The librarian charged with expanding the collection for the BAS has experience in health sciences resources and will be working with staffs at university libraries to ensure that the collection will meet both programmatic and accreditation requirements. Beyond the funds allocated in the BAS budget, in 2005-06 the Library Media Center (LMC) was provided $100,000 in one-time funding to improve its collection and has increased the LMC based budget by $25,000 per year for the purpose of adding to the college's core collection. In addition nearly $5,000 per year is allocated from Perkins funding to pay for the Cumulative Index for Nursing and Allied Health Literature (CINAHL). Because the college has a substantial number of allied health programs, their library resources include 38 online and print subscriptions to a variety of allied health journals.

Students in the current allied health programs at BCC already have access to the extensive medical libraries at all regional medical centers throughout the state where BCC has clinical sites. This access will be extended to all BAS students.

Current LMC services for students, faculty, and staff include instruction, reference, circulation, reserves, periodicals management, interlibrary loan, and media services. All points of service are staffed during library hours and the LMC website can receive email messages anytime, from any location. The LMC is open 73 hours per week and the staffing is adequate to meet patron needs.

Instruction is at the core of all services offered by the LMC. There is ongoing and increasing demand for classes on information literacy taught by librarians, and classroom teaching is a basic part of each librarian's workload. Reference librarians are available to respond to student inquiries and, while the overall objective is to provide students with skills to do their data gathering independently, reference work commonly involves individual instruction at various levels. Frequently, instruction includes the use of technology, and virtual reference service is available via the Internet. Students, faculty, and staff have access to the same e-mail service for course reserve materials, requests for media equipment, and inter-library loans. Materials needed for courses are processed and circulated in a timely manner, according to guidelines from instructors.

- **Will the advanced imaging science classes require equipment not used or available at the applied associate degree level? If the current equipment also serves at the bachelor's level please provide additional information about the current equipment.**

The advanced imaging science classes will require no specialized equipment beyond what is currently offered in BCC's AA programs. As indicated in the proposal, any coursework requiring the use of advanced imaging equipment will be taught through the college's many clinical affiliates and other clinical sites throughout the state.

- **Provide additional information on the cost and approach for making the Online Student Credit Audit Review (OSCAR) serve the audit of the bachelor's at BCC. (could be addressed under 4.A)**

The process for adding the BAS degree will be similar to the one currently used for AA degrees. First, the new courses will be added to the course catalog system of the HP. Second, the new degree option structure will be built within OSCAR, which identifies courses and defines the rules for what is required for completing graduation requirements. Supporting pivot tables will be built that define all of the possible options. We estimate the cost to do this will be no more than $1,000 which will be for someone's time to create the courses and rules in OSCAR.

Principle: Capacity & Sustainability	
Criteria 3.B	**Standards**
Has analyzed the faculty/staff needed, the education and professional experience qualification of faculty members relative to teaching assignments and anticipated sources of qualified faculty and staff.	**Requirement**: What kind of staff needed

- **Given the distance learning plan, will you have requirements for faculty regarding ability to teach effectively using distance learning technologies?**

Most of the faculty identified to teach in the BAS program already have successfully developed and taught courses using distance learning technologies. The college will add distance learning experience as a desired characteristic for anyone being hired to teach in the program.

BCC has a fully staffed Faculty Resource Center, which has been an effective resource to assist faculty in creating and teaching hybrid (partially in class and partially online) or online (entire course is taught online) courses. The Center is available to any faculty member who requires assistance with developing curriculum or converting a course to a distance format.

The distance learning program does regular assessments of all distance courses to determine their effectiveness, and this will be the case for all distance BAS courses.

Principle: Maintain 2-Year Focus	
Criteria 4.A	**Standards**
Has an adequate and appropriate student services plan.	**Requirement**: Describe plan

- **Provide additional information the negotiations with the Department of Education relate to the TRiO program's applicability to bachelor's level students.**

The director of the TRiO program contacted the Department of Education who indicated that the program could be extended to bachelor's level students. This means that first-generation college students, low-income students, or students with a documented disability will be eligible for their services, including tutoring, study skills, advocacy, and laptop computer lending.

Principle: Open Door	
Criteria 5.A	**Standards**
Has a plan for selective admissions processes, if used for the bachelor's program, consistent with an open door institution.	**Requirement**: Describe admissions approach

- **Provide more information on how the proportionality formula for feeder colleges fits into a first come, first serve admissions process.**

BCC administrators, faculty and staff involved in the proposal have done a great deal of thinking and planning as to how to remain true to the open door mission of community and technical colleges while addressing the pent-up demand for this program, but acknowledges that there is still work to be done in this area to develop a final, workable admission plan. The college has several goals that it wishes to address through its admission policy for the BAS program. BCC is committed to being an open-door college; providing good geographic representation for students throughout the state; ensuring that working professionals are well represented in the program; and providing a mechanism to encourage a diverse student body. We expect the admission essay discussed in the original proposal will help the college to select an incoming class that balances these goals. BCC will consult with appropriate authorities to ensure its admission and transfer practices fulfill all state and federal laws.

The formula that the college is currently studying would set aside at least 30 percent of the available slots in each incoming class for graduates of programs other than BCC, including

incumbent workers and direct transfers, and 10 percent for special consideration admissions. This will help the program meet its commitment to having each incoming cohort be diverse and representative of different geographic areas of the state. These categories would be filled to the extent there are qualified applicants based upon the essay and pre-promulgated criteria for admission identified in the original proposal. If there are not enough transfer applicants to meet the categories, those slots would be released to other students on a first-come, first-served basis. These slots will be filled in the order that completed qualifying applications are received and certified by the college.

- **Do you have any specific plans for targeted recruitment from the 22% students of color in the current applied associate degree programs to assure diversity in the bachelor's program?**

BCC has experience in recruiting targeted populations to help assure diversity among its allied health programs. Many of the concepts being applied in BCC's federal grant to increase diversity in the associate degree nursing program will be used to promote diversity in the BAS program. The college is developing an aggressive marketing plan to ensure that each incoming class is well diversified. The plan includes:

- Recruiting some of our graduates who are people of color to serve as roles models and make presentations to currently enrolled associate degree students to encourage them to pursue the bachelor's degree;
- Engaging in targeted marketing in hospitals and clinics and through mailed marketing materials to encourage technologists of color to apply to the program; and,
- Working with hospitals and clinics on additional strategies to attract a diverse student body to become their advanced technologists and managers in a few years to help increase the percentage of people of color working in these fields.

The bachelor's degree expert identified on the original Bellevue Community College cover page, has been invited to present a lecture in Egypt during the date of the scheduled interviews. Another degree expert, Duane Akroyd, has been identified to serve as the college's expert witness. This replacement cover page contains his contact information, and a hotlink to his vita.

Cover Page
Proposal to Pilot a CTC Applied Bachelor's Degree
STATE BOARD FOR COMMUNITY AND TECHNICAL COLLEGES

College: Bellevue Community College	Date: January 17, 2006
Contact: Paula Boyum	
Phone: (425) 564-2265	E-mail: pboyum@bcc.ctc.edu
Proposed Bachelor's Title: Bachelor's of Applied Science in Radiation and Imaging Sciences	
Primary Related Applied Associate Degree(s) or, if any, certificates with a pathway directly to the BAS:	
AAS-T or ATA Title: Radiologic Technology	2004-05 Degree Graduates: 36
AAS-T or ATA Title: Diagnostic Ultrasound	2004-05 Degree Graduates: 25
AAS-T or ATA Title: Radiation Therapy	2004-05 Degree Graduates: 16
Certificate with direct pathway : Nuclear Medicine	2004-05 Graduates: 8
Number of Junior FTE requested for 2007-08: 20	
Junior students headcount expected 2007-08: 50	
Number of Upper Division FTE requested for 2008-09: 40	
Content Experts list 2 people in each category. Provide complete contact information.	
Industry	Similar Bachelor's Degree
Jeff Lewis Supervisor, Technical Services First Hill Clinical Site Supervisor Swedish Cancer Institute 1221-1225 Madison Street Seattle WA 98104 Direct: (206) 215-6102 Pager: (206) 405-9009 Jeffery.Lewis@swedish.org	Duane Akroyd, Ph.D. Professor and Director of Graduate Programs Department of Adult and Community College Education College of Education North Carolina State University duane_akroyd@ncsu.edu Direct: (919) 515-1745 Cell phone: (919) 630-6314 Hotlink to: Duane Akroyd vita
Signature of College President B. Jean Floten by Laura Saunders (see PDF for signed page) Date 1-11-06	

Bryan - why Seattle U progr doesn't meet demand.
Anthony - electives?

- class only offer so many electives
Paula - so many add tech classes
Linda - grads

Cover Page
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Industry	Similar Bachelor's Degree
Jeff Lewis Supervisor, Technical Services First Hill Clinical Site Supervisor Swedish Cancer Institute 1221-1225 Madison Street Seattle WA 98104 Direct: (206) 215-6102 Pager: (206) 405-9009 Jeffery.Lewis@swedish.org	Richard R. Carlton, M.S., R.T. (R), (CV), FAERS Director, Associate Professor, Radiologic and Imaging Sciences Grand Valley State University College of Health Professions, Cntr for Health Sci 301 Michigan Street NE (616) 331-5953 carlton@gvsu.edu
Signature of College President Laura Saunders	Date 1-11-06

Duane Akroyd
Registered radiographer

Proposed Bachelor's Title: Bachelor of Applied Science in Radiation and Imaging Sciences

Bellevue Community College (BCC) has developed an applied bachelor's degree program in radiation and imaging sciences that will effectively meet the needs of technologists and employers, provide Washington state with a more skilled radiation and imaging workforce, and address the changing nature of this specialty. The degree offers two concentrations to prepare employees who will (1) supervise radiation or imaging departments or (2) provide advanced technical expertise in radiation and imaging fields. In documenting the need and designing the curriculum, BCC surveyed students, working technologists, and state and regional employers, all of whom endorse and support the need for this degree. The degree has been approved by the BCC Curriculum Advisory Committee, college administration, and the BCC Board of Trustees.

Brief Description of the Expected Outcomes – Please describe the expected outcomes for students and employers as a result of offering the proposed pilot applied bachelor's degree.

The primary program outcome is the preparation of bachelor's degree holders in the field of radiation and imaging technologies who can adapt to substantial changes in their field, including continuous advances in technology; the emerging interrelation of different technologies; increased employer and professional society demand for bachelor's degrees; and the need for hospitals and clinics to have appropriately educated technology team supervisors and managers.

- **Quantity of graduates to fill the demand:** This proposal documents the need for more than 313 new radiation and imaging supervisory positions in Washington each year and 525 new positions requiring advanced technologist skills. The bachelor of applied science degree (BAS) will annually prepare 20 new bachelor's degree graduates for positions as supervisors and advanced "super" technologists.

- **Value to employers:** Healthcare employers have expressed a need for radiation and imaging supervisors and managers who have both technical preparation and an understanding of management principles. Currently they must rely on managers who cannot obtain the proper educational preparation. This BAS will provide the only educational pathway in the state that combines core knowledge and skills in the essentials of health care business and management with advanced technology skills, thereby creating more effective managers. No other program in the state meets this need.

  Employers also need "super" technologists who can provide services in multiple or emerging technologies. This BAS will teach new complex technical skills to radiation and imaging technologists to provide better patient services and more efficiently run departments.

- **Value to graduates of the associate degree programs in WA:** Students in the BAS will have access to a bachelor's degree in their field at a reasonable cost without having to leave their communities. They will gain the knowledge and skills to step into increasingly responsible positions in their chosen field with an excellent career progression and a better than average salary expectation ($80,000 - $120,000 per year). The BAS degree will also provide a direct pathway for those who want to obtain a master's degree in order to move into senior management positions in their field.

Principle: Service to Placebound Students	
Criteria 1.A	**Standards**
Program fills a gap in options available for students because it is not offered by a public four-year institution of higher education in the college's geographic area	**Requirement**: Provide evidence that no public bachelor's institution offers or has submitted a pending Notice of Intent (NOI) to offer this degree or related degrees serving the placebound graduates of relevant applied associate degree programs in the college's geographic area. **For a stronger proposal**: Additionally, provide evidence that no public bachelor's institution offers degrees serving the graduates of relevant applied associate degrees programs in the region (broader than college's catchment-area) or state.

No Washington State Public or Private Institution Offers This Degree

No college in Washington state offers a bachelor's degree in the field of radiation or imaging technology that includes both advanced technology and management in one degree. Currently, technologists who want to complete a bachelor degree in their field must seek education as far away as Oregon, Idaho or Oklahoma. Seattle University offers a BS in diagnostic ultrasound but it does not include management courses. Other Washington colleges offer degrees in health services, such as the University of Washington, Washington State University, and Eastern Washington University, but none combines health care management courses with advanced education in radiation or imaging. The program BCC proposes is unique in Washington state. There are no Notices of Intent or planned programs filed with the Higher Education Coordinating Board for bachelor's programs in radiation, imaging or health care management.

No Articulation Options are Available in Washington

For students with an associate degree or certificate in radiation therapy, radiologic technology, diagnostic ultrasound or nuclear medicine, there is no public university option in this state where they may transfer as juniors. Without a bachelor's degree, it is nearly impossible to obtain a graduate degree in a health science field. This lack of a degree pathway closes the door on employment opportunities for technologists, which was corroborated by health care organization employers who responded to the college's survey (Appendix 1)[1] or participated in a BCC focus group (Appendix 2). They overwhelmingly preferred that their employees have a bachelor's or higher degree for mid-level (58 percent) and upper-level (86 percent) supervisory and management positions.

The applied bachelor's degree will provide an essential advanced education opportunity where none currently exists to the 5,000 practicing radiation and imaging technologists in Washington and the 245 students in radiation and imaging programs.

[1] **Please note: All words shown in blue and underlined are "hot linked". To access the supporting material, hold down the Control key and left-click the mouse anywhere on the item.**

Principle: Service to Placebound Students	
Criteria 1.B	**Standards**
Demonstrate demand for the proposed program from a sufficient number of students within its service area to make the program cost-effective and feasible to operate	**Requirement**: Provide evidence that the number of students graduating from relevant applied associate degree graduates in the catchment-area result in sufficient students going on for the BAS each year to match the planned junior year FTE request. Currently about 10% of applied associate degree graduates transfer. National data indicate that the transfer rate could be as high as 30%. **For a stronger proposal**: Provide evidence of student demand from multiple sources. Examples of other evidence include transfer trends for similar applied associate degree programs; demand in excess of opportunity to enroll in related traditional bachelor's programs; changes in industry requirements such that upgrading the bachelor's will be necessary.

The BCC radiation and imaging technology associate degree and certificate programs regularly draw students from across the state, with 84 percent of their student population from outside the BCC service area. Since the proposed BAS program is unique in Washington state, and with BCC proposing to include distance instructional delivery options, the area served by the program for the BAS program is expected to be statewide.

The proposed BAS program will draw students from the following populations: (1) BCC graduates in radiation and imaging sciences; (2) graduates from other similar associate degree and certification programs; (3) incumbent workers who want to move into management; (4) incumbent workers who want to acquire advanced technology skills; (5) technologists and students who need a bachelor's degree once it is enacted as the industry standard.

To estimate the student population for the BAS program, BCC reviewed in detail state and regional employment statistics provided by the Bureau of Labor Statistics, and employment trends reported by radiation and imaging professional associations. BCC also conducted state-wide surveys of students in radiation and imaging technology programs (Appendix 3), and working technologists (Appendix 4) to assess the level of interest in the new program. Even with conservative estimations and assumptions, data presented demonstrate demand for the proposed program from both program graduates and incumbent worker populations.

Graduates from BCC Radiation and Imaging Technology Programs

BCC is the only college in the state to offer programs in all four areas of radiation and imaging sciences. These graduates account for over one-third of the practicing technologists in the state.

BCC Program Graduates	**2003**	**2004**	**2005**
Diagnostic Ultrasound Technology	21	24	25
Radiation Therapy	9	14	16
Radiologic Technology	25	41	35
Nuclear Medicine Technology	4	5	8
Total Graduates	**59**	**84**	**84**

Graduates from Other Radiation and Imaging Technology Programs in Washington

Since the proposed bachelor's degree program is unique in the state of Washington, graduates from the other six imaging programs in the state (Bellingham Technical College and Tacoma Community College, Wenatchee Valley College, Yakima Valley College, Sacred Heart Hospital and Pima Medical Institute) will be eligible to apply for entry into the program. (See Criteria 1.C for articulation). The number of graduates from these combined programs in 2004-05 was **161.**

BCC is also engaged in conversations with Clark College, Columbia Basin College, and Spokane Community College who are planning to start radiology programs. If these programs are approved, they will become additional feeders into BCC's applied bachelor's degree.

Students participating in every imaging and radiation program in Washington were surveyed. Of the 169 responses, 79.7 percent – 135 students – indicated that they would be interested in participating in a bachelor's degree program. Professional growth and career advancement were the primary reasons for interest in the program.

Incumbent Technologists Who Would Benefit from the Proposed BAS Program

BCC's radiation and imaging associate degree programs draw students from across the state, and the college expects a similar trend for the BAS program. Therefore, labor statistics for technologists in King County, Puget Sound and Washington state were examined to determine the size of the population of incumbent workers who might benefit from the BAS program.

WA State Bureau of Labor Statistics — 2007 Employment Projections	Seattle-King County	King – Pierce - Snohomish Counties	State of Washington
Diagnostic Medical Sonographers	233	398	771
Nuclear Medicine Technologists	116	167	342
Radiologic Technologists	1,110	1,777	3,736
Technicians and Radiation Therapists	171	265	298
Total Incumbent Technologist Population	**1,630**	**2,607**	**5,147**

Incumbent Workers Who Want to Move into Supervisory and Management Positions

The American Registry of Radiologic Technologists (ARRT) lists 4,200 technologists and 635 managers, supervisors and chief technologists in Washington. This equates to one supervisory position for every 5.6 technologists. For the entire population in all four fields, this would equate to about 926 managers and supervisors. Moreover, it is expected that the ratio of supervisors/managers to the number of technologists will continue to increase based on the following trends: (1) convergence of diagnostic and therapeutic technologies and practices; (2) increased diversity and flexibility in the technologist staff; (3) increased regulations and complexity of health care insurance management plans; (4) increased complexity of care; and (5) greater need for communication with patients.

BCC surveyed working technologists across the state of Washington, receiving a total of 378 responses; 69 percent expressed a strong interest in pursuing the proposed bachelor's degree. Reasons mentioned included: (1) personal satisfaction; (2) professional growth; and (3) career advancement.

The following table provides a summary of each category of prospective applicant demand and presents a very conservative estimate of both categorical and total demand.

Planning Projection for BAS Program Annual Pool of Applicants				
	BCC graduates	**Graduates from other WA State colleges**	**Incumbent workforce Seattle-King County (2007)**	**Incumbent workforce Washington (2007)** (excluding King County)
Total population	84 graduates	161 graduates	1,630 incumbent technologists	3,517 incumbent technologists
Estimated percentage of applicants	10-30%*	10-30%*	1-5%	1-5%
Estimated population with interest in BAS program	8 to 25 prospective applicants per year	16 to 48 prospective applicants per year	16 to 81 prospective applicants from incumbent technologists	35 to 176 prospective applicants from incumbent technologists

*Actual percentage of program graduate who expressed interest in the BAS program from survey respondent is **80%**

Using current state and national transfer rates provided by the SBCTC for new program graduates to determine annual demand for the program, the 245 annual two-year Washington radiation and imaging program graduates would potentially result in 24 applicants at 10 percent and 73 applicants at 30 percent. Factoring in demand from the statewide incumbent workforce at even a very low one percent per year would generate 51 applicants and 257 applicants at five percent. Therefore, the program could expect to attract at least 75 applicants a year using the most conservative estimate,. to a high of about 330.

Principle: Service to Placebound Students	
Criteria 1.C	**Standards**
If applicable, has a plan for program articulation with nearby colleges.	**Requirement**: Indicate why articulation is or is not applicable. If applicable, describe articulation plans and the number of students expected from nearby colleges.

Articulation with Other Colleges

The BAS in Radiation and Imaging Sciences will be open to students in Washington community and technical college radiation and imaging programs, including Bellingham Technical College, Tacoma Community College, Wenatchee Valley College, and Yakima Valley College, and, as well with the planned programs at Columbia Basin College, Clark College, and Spokane Community College. The presidents and program chairs of these colleges have endorsed the BCC BAS and written letters of support (Appendix 5).

BCC will offer co-admission articulation agreements to students at each "feeder" college who declare their intent to enter the BAS while they are currently enrolled in the associate program. These agreements will direct students to complete preferred general education prerequisites that

will facilitate immediate transfer. BCC will award seats for transfer students from other colleges based on proportionality of applicants from all colleges.

Direct Pathway to a Master's Degree Program

The School of Public Health and Community Medicine at the University of Washington has agreed that graduates from the BCC BAS in Radiation and Imaging Sciences will be eligible for admission to the Master of Health Administration (MHA) program. The administrators and faculty in the MHA program are eager to expand linkages between the two programs and to work with BCC on curriculum development (Appendix 6). While technologists will have access to supervisory and middle management positions through completion of the BAS, the pathway to a master's degree will provide radiology and imaging technologists access to upper level management positions, thereby offering a complete career ladder for students.

Principle: Part of Workforce Mission	
Criteria 2.A	**Standards**
The college can demonstrate that employers demand the level of technical training proposed within the program, making it cost-effective for students to seek the degree.	**Requirement**: Based on the data sources described, document either that state-wide demand in the proposed occupational area substantially exceeds current state-wide supply, or local demand substantially exceeds local supply. **For a stronger proposal**: Document a supply-demand gap at both the state level and in the local region.

Bellevue Community College conducted extensive research to validate the industry demand for the proposed Radiation and Imaging Sciences BAS program. Sources included (1) national and regional Bureau of Labor Statistics reports; (2) professional organization studies; (3) Washington Higher Education Coordinating Board reports; and (4) Workforce Training and Education Coordinating Board reports. Moreover BCC conducted extensive research in addition to a large employer survey and an industry focus group conducted by BCC to validate need for the program. All sources presented in this section and the appendices contribute to forming a picture of a strong and sustained demand for graduates from the proposed Radiation and Imaging Sciences program.

Industry Demand for Technologists to Have a Bachelor's Degree

Because the fields of radiation and imaging are becoming increasingly more complicated, requiring greater independent decision-making, critical-thinking skills, understanding of more complex technologies and more rigorous health care regulations, the American Society of Radiologic Technologists (ASRT) and hospitals and clinics nation-wide are calling for the bachelor's degree to become the entry-level degree in the field. In 1999, the ASRT passed a resolution that is expected to become the industry standard, supporting the bachelor's degree as the entry-level degree. (ASRT 1999, www.asrt.org/media/pdf/whitepaper.pdf)

Based on the 2005 HECB *Analysis of Training Levels by Occupation* report, it is estimated that out of the projected 140 annual job openings in the fields of radiation and imaging technologies, 33 positions (or 24 percent) will require a BA degree and six will require a master's degree.[2]

In addition there is a rapid push for increased technology skills and knowledge for these professions that go beyond the scope of a two-year degree. In its *2004-05 Occupational Outlook Handbook,* the U.S. Department of Labor Bureau of Labor Statistics[3] sites a number of factors:

- Radiologic technologists who also are experienced in more complex diagnostic imaging procedures, such as CT or MRI, will have better employment opportunities, as employers seek to control costs by using multi-skilled employees.
- Sonographic technology is expected to evolve rapidly and to spawn many new sonography procedures, such as 3D-sonography for use in obstetric and ophthalmologic diagnosis.
- Bringing together into one machine or one procedure technologies that used to be separate is another major trend. Examples include PET/CT scanners enabling doctors to more accurately detect cancer and pinpoint its exact location. This trend will increasingly require technologists to be cross-trained on multiple equipment and modalities.

Local and Regional Employer Demand

good, Health care employers, professional societies and community organizations throughout the state support the proposed bachelor's program and have written letters of support and endorsement indicating their need for supervisors/managers and advanced radiation and imaging professionals with bachelor's degrees (Appendix 7).

BCC Employer Survey

BCC sent the employer survey to 48 radiology administrators at hospitals and large imaging centers in the Puget Sound region; 36 surveys were returned. Although employers indicated that bachelor's or higher degrees are currently not required until one is applying for an upper-level management position, they emphasized that they would prefer bachelor's degrees in applicants for mid-level management positions. Half of those surveyed believe there are not enough people with bachelor degrees in Washington to meet the needs of their organizations. Employers see the biggest barrier to moving people into supervisory and leadership positions is finding the time to train them in the specific management skills for the radiation and imaging field. Other results of the employer survey can be summarized as follows:

- 83 percent indicated that they would hire graduates of a bachelor's degree program in radiologic sciences.
- 78 percent indicated they would encourage their employees to pursue such a degree.
- 75 percent would offer tuition reimbursement and other incentives to pursue the degree.

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[2] May 2005Washington State Occupational Forecast with HECB Analysis of Training Levels by Occupation; http://www.hecb.wa.gov/autheval/dpr/documents/occupationandedtables.xls

[3] The Personnel Crunch: A Crisis in the Radiologic Technology Work Force, American Society of Radiologic Technologists, 2001

BCC Employer Focus Group

BCC conducted a focus group in June 2005 with eight individuals in supervisory and management positions in radiology, nuclear medicine, and radiation therapy. The group was diverse with education ranging from those who acquired their skills from on-the-job training to individuals possessing MBA degrees. Participants included representatives from medical centers and clinics in both non-profit and for-profit sectors. Their views mirrored those of other hiring surveyed officials. Specifically, the focus group identified the following industry trends:

- An increasing number of jobs require a minimum bachelor's degree education, and a bachelor's degree will eventually be required for all supervisory positions.
- More education in new technology areas will be essential.
- More complex management skills will be required of people in supervisory positions.
- A bachelor's degree equates to a salary increase in most positions.
- Technologists in supervisory positions have increased responsibilities and would benefit from specific radiation and imaging health care-related management education.

General Regional Trends that Impact the Radiation and Imaging Technology Professions

Washington State Outlook

State and Regional Needs Assessment

The Washington Higher Education Coordinating Board (HECB) states the following in the September 2005 State and Regional Needs Assessment report[4]:

- State, regional, and community assessments indicate a need for increased capacity in . . . health care.
- The state should reverse the trend of the past three years, when the number of graduate degrees declined in . . . health, which are all important fields from the perspective of the state's employers.
- Washington is unique in that we are a leader in innovation and technology-based industries; however, that leadership position has relied heavily on drawing highly trained workers from outside of Washington, especially in . . . and health care occupations.
- Health care practitioners . . . stand out as an area where a substantial number of workers enter the occupation with a bachelor's or complete a bachelor's while working.
- Training needs in health care are significant at all levels. . . .

A recent report from the health care personnel shortage task force indicates high levels of need and difficulty hiring qualified workers in a wide range of health care occupations at all educational levels.[5]

Washington State Job Vacancy Survey

Examination of the *Washington State Job Vacancy Survey* for April-May 2005[6] revealed three relevant facts concerning the lack of sufficient working health care technologists:

- With an estimated 14,195 job openings, health care had more than twice as many openings as any other industry in April-May 2005.
- Health care practitioners and technical occupations accounted for the largest share of vacancies in April-May 2005 (8,918 vacancies, or 13 percent of all vacancies)
- Health care practitioners and technical occupations had the highest percentage of permanent openings (99 percent), and reported the highest percentage of openings requiring certification/licensing (90 percent).

[4] State and Regional Needs Assessment. Washington Higher Education Coordinating Board, September 2005.

[5] Progress 2004: A Report of the Health Care Personnel Shortage Task Force. Workforce Training and Education Coordinating Board, December 2004; http://www.wtb.wa.gov/HCRPT05.PDF

[6] Washington State Job Vacancy Survey. Washington State Department of Employment Security, July 2005; http://www.workforceexplorer.com/admin/uploadedPublications/5159_JVSApr-May_05.pdf

Washington State Board of Community and Technical Colleges Baccalaureate Capacity Study
The 2004 baccalaureate capacity study conducted by the Washington State Board of Community and Technical Colleges reported the following findings:

- Technicians moving from their specialty into management and those planning to work at a more advanced level in their professional/technical specialty need education beyond their initial associate degree. Industry representatives favor development of additional applied baccalaureate degrees in both management and professional technical specialization.
- The study documents the need for 3,000 additional FTE at the junior and senior level to meet this current and future demand to 2010 for baccalaureate degree options for technical degree graduates. This demand will not be met entirely by the growth already planned in institutions currently grantors of baccalaureate degrees.
- Community or technical college bachelor's degrees are a valid alternative used in other states for meeting some of the need such a BAS in Radiologic Technology or a Technology Management degree.[7]

King County Outlook

The Workforce Development Council of King County (WDC)[8] has reported broadly on the field of health care and its projected growth within the county. The WDC identified health care as one of the largest employment sectors in Washington state. Hospitals alone employ over 75,000 people - more than Boeing, Microsoft, or Safeway.[9] Employment growth in the industry is expected to continue, creating over 10,000 new health care jobs in Seattle-King County alone by 2012. Of these 10,000 new jobs, nearly 60 percent are expected to be in professional/technical classifications.[10] In 2004, employers reported over 8,000 job vacancies for health care practitioners and support personnel.[11]

Principle: Part of Workforce Mission	
Criteria 2.B	**Standards**
Has a plan for development of the curriculum that represents a level of rigor and knowledge above the level of the related applied associate degree.	**Requirement:** Describe both the technical curriculum for the BAS and the general education component of the bachelor's degree (both the portion expected from the applied associate level and the portions at the upper division level).

Curriculum Development

This BAS is specifically designed for nationally certificated radiologic technologists, radiation therapists, nuclear medicine technologists or diagnostic medical sonographers who need both advanced competence to address industry-specific expectations and education in management practices for the highly regulated and controlled health care environment of today.

BCC has modeled the upper division curriculum design on: (1) a review of current literature; (2) successful four-year radiation and imaging programs; (3) standards of radiation and imaging professional and accrediting societies; and (4) identified regional employer needs that were

[7] Baccalaureate Capacity Study Findings and Recommendations. Washington State Board of Community and Technical Colleges, January 2005; http://www.sbctc.ctc.edu/education/default.asp
[8] Sector Analysis: Health Care. Workforce Development Council of Seattle-King County, 2005; http://www.seakingwdc.org/Templates/be_secini_hc.html
[9] The Business of Caring. Washington State Hospital Association, 2004.
[10] Economic Contribution of the Health Care Industry to the City of Seattle. June 2004.
[11] Progress 2004, Health Care Personnel Shortage Task Force. December 2004.

validated through targeted focus groups and surveys. The resulting curriculum incorporates discipline-based, general education, and elective courses that build progressive rigor and sophistication, designed to develop broad knowledge, characteristic of four-year degrees, as well as focused advanced coursework in the field. Moreover, BCC is committed to ongoing quality improvement within the applied bachelor's program through ongoing assessment processes that include internal and external review in order to assure the new degree program meets standards for quality and rigor, and fulfils the identified industry-based needs.

Radiation and imaging bachelor's programs at Oregon Institute of Technology, Boise State College, Idaho State University and Oklahoma State University were examined and used to develop the BCC curriculum. Appendix 8 compares the management course offerings of the proposed program to these four programs. The BCC program will offer more management courses with considerably more rigor than any of these alternatives. The college will also provide a greater variety of professional courses than are offered by these other programs.

Program faculty examined the general education requirements and level of scholarship at the state's comprehensive universities and used this model to develop its general education component and evaluate course sophistication. Feedback from the employers' survey and focus group was factored into the program design and indicated courses should be taught from a health care perspective – rather than general management – and include finance, marketing, leadership, and human resources.

Curriculum

Students entering the program as juniors will have demonstrated their technical proficiency through achievement of national professional certification. Prerequisites require the equivalent of English composition, intermediate algebra, two courses in human anatomy and physiology, and a course each in humanities, social sciences and business. Entrants into the program will be awarded 90 credits, based on satisfaction of these program prerequisites (see Section 5A).

The BAS program advances the student's technical expertise, provides breadth of knowledge through general education courses, and meets the specific needs of the student's career plans through discipline specific and elective options provided by two concentrations. All students in the bachelor's program will take a core of general education courses whose content is focused on the field of health care and subjects that will help them better understand their roles as managers and advanced technologists. A series of required health care management courses will teach students the essentials of health care business and management. Every student will be required to engage in a capstone project and a practicum or clinical experience. The University of Washington School of Public Health and Community Medicine will work with BCC on a model for integrating leadership skills into the program based on the Masters in Health Administration curriculum. In addition to the required courses, to complete the major, students will select a concentration in either Health Care Management or Advanced Radiation and Imaging Technology for their additional required and elective courses.

- The ***Health Care Management*** concentration will provide in-depth health care management and organizational theory knowledge and skills, along with an understanding of technologies outside the students' areas of expertise to enable them to be effective administrators; this concentration will provide the basis for those who want to continue to advanced studies in

health care management. Graduates in this concentration will be qualified to become managers and supervisors in hospitals, radiation and technology clinics and imaging centers.

- The ***Advanced Radiation and Imaging Technology*** concentration will teach advanced technical knowledge and complex skills to facilitate advanced certification in areas like computed tomography (CT), magnetic resonance imaging (MRI) and other specialized fields. This option will help technologists keep pace with rapidly changing technologies and expand into new high demand technology areas.

The specific curriculum, showing both concentrations is outlined below.

Required Core Curriculum for All Students		
General Education	MATH 130	Statistics
(30 credits)	ENGL 201	The Research Paper
	PHIL 300-level	Case Studies in Medical Ethics
	SPCH 300-level	Intercultural Communication
	ECON 300-level	Economics of Health Care
	GBUS 101	Introduction to Business
Management Courses	HCMGMT 301	Essentials of Imaging and Therapy
(15 credits)	HCMGMT 460	Management and Leadership
	HCMGMT 475	Capstone Project

Radiation and Imaging Management Concentration (HCMGMT)		
Required courses	HCMGMT 320	Finance and Accounting for Health Care
(30 credits)	HCMGMT 325	Organizational Theory
	HCMGMT 340	Human Resources in Health Care
	HCMGMT 350	Legal and Regulatory Aspects of Health Care
	HCMGMT 401	Marketing in the Health Care Environment
	HCMGMT 440	New Business Planning for Health Care
Electives	Choose from ARIT offerings	
(15 credits)	- 23 available courses, 72 credits in ARIT	
	- also clinical practica (12-13 credits each)	

Advanced Radiation and Imaging Technology Concentration (ARIT)		
Required courses	ARIT 301	Cross-Sectional Anatomy
(14 credits)	ARIT 303	Body Pathophysiology
	ARIT 304	Neuropathophysiology
	ARIT I 410	Quality Assurance/Accreditation
Electives		
(31 credits)	Choose from HCMGMT and ARIT courses	
	- 5 available courses, 30 credits in HCMGMT	
	- 19 additional courses, 58 credits in ARIT	
	- clinical practicum courses (12-13 credits each)	

For more curriculum information, please see Appendix 9, list of elective courses; Appendix 10, four-year curriculum maps for students with different associate degrees; Appendix 11, alignment with BCC graduation requirements and general education requirements at Eastern Washington University; and, Appendix 12, management course outcomes.

Level of Rigor and Expectations of Student Learning

BCC recognizes that 300 and 400 level courses are characterized by increasing rigor and sophistication. The college has researched best practices of universities with strong bachelor's programs and has identified some general education outcomes for upper-division courses that will be applied in the BAS program. Graduates of the BAS program will be able to (1) research, analyze, synthesize, present and discuss information; (2) use independent study, self-motivation, creativity and critical thinking; (3) be actively involved in the selection of project topics and emphasis; (4) apply case studies and real-world scenarios to their fields; (5) interpret, critique, validate and debate information and different perspectives; (6) use business-level verbal and written communication and interactions; (7) reflect a respect for the dignity and individuality of every person; (8) interact in an effective goal-directed manner; (9) collaborate as a member of the health team to facilitate the adaptive process; (10) use adaptation theory in analyzing environmental influences; and, (11) commit to fulfill the responsibilities of a professional practitioner in contemporary society.

Credit for Prior Learning

Many prospective students may have already taken courses required for advanced certification before they enter the program. Students who have completed advanced courses that are part of the BCC curriculum will be eligible to petition for prior learning credit. The college will develop a program for assessing and providing credit for prior learning that follows the Washington Community and Technical College *Guidelines for Prior Learning Assessment.* Program faculty will assess prior learning and supervise the award of equivalent credits.

Principle: Capacity & Sustainability	
Criteria 3.A	**Standards**
Demonstrates the capacity to make a long-term commitment of resources to build and sustain a high quality program.	**Requirement:** Provide a financial plan for the degree program proposal, including a three year (FY 2008, 2009, and 2010) projections of all costs, expenditures and revenue streams to support the proposal (differentiating revenue from the new pilot FTE funding, employer contributions and any anticipated redistribution from existing funding), and a description of adequacy of facilities, equipment and other instructional resources required by the bachelor's program. Also, document a history of financial stability that demonstrates the capacity to undertake and to sustain new instructional initiatives.

BCC has a long history of financial stability and has shown a high level of creativity for developing, funding and maintaining new programs. It has stability in leadership and staffing and is committed to successfully launch and sustain this important academic enterprise that will meet the needs of industry, students and the state.

Financial Stability

BCC is a financially stable college. Over the years, the college has actively developed other sources of revenue to minimize its dependence on the state allocation and guard against temporary budget fluctuations. BCC's state allocation is 41 percent of its budget (compared to the state average of 54 percent for community and technical colleges). BCC has been resourceful

in developing alternative funding for professional development, new program planning, student scholarships, and top-end equipment for improved learning environments, such as a planetarium digital projector, a scanning electron microscope, and a four-climate biosphere greenhouse. Moreover, BCC has started and sustained many new programs over the last decade, in such fields as bioinformatics, information technology, and allied health, many of which have qualified for high demand FTES funding. Further, BCC has developed alternative sources of funding for major capital construction such as the student services center, the NWCET, and the child care center. Programs that require state-of-the-art expensive equipment, such as radiology and imaging technology, have been very successful in securing the support of industry partners for use of equipment and clinic sites for practicum courses. The College's recent accreditation report commended the college for its successful collaboration in the face of difficult budget reduction decisions. Finally, BCC has always received excellent financial audits, with no financial findings. All of these are attributes of financial resourcefulness and stability.

Bachelor's Sustainability

Bellevue Community College has many strengths that will enhance its suitability for beginning and sustaining a bachelor's program.

- BCC has stability in its leadership. College staff building the program are very committed to its successful execution and long-term stability.
- Job outlook and employer research shows a long-term, sustained demand/need for the proposed bachelor degree; "feeder programs" within the state are able to sustain the necessary flow of students into the program; and, student and incumbent worker surveys document significant student interest in obtaining the bachelor credential.
- BCC has a highly developed program of general education and liberal arts, as demonstrated by the breadth and depth of its curricular offerings, with over 68 academic disciplines, with over 54 PhDs currently on staff, which will facilitate the general education and elective requirements for the bachelor credential and meet accreditation standards.
- BCC has experience with providing student, library and other services to bachelor's level students through its partnership with Eastern Washington University.
- BCC has a strong history of student support and a culture that fosters student success through its science study lab, tutoring services, math and writing labs, TRiO support services, and other student services.
- BCC has demonstrated successful development and a commitment to maintaining advanced certificates in areas such as Medical Informatics and Bioinformatics.
- BCC has a strong record in sustaining and implementing new programs such as Interdisciplinary Studies, Business Intelligence Developer, Business Intelligence Analyst, Database Specialist, Medical Informatics and Phlebotomy, to name a few.

Planning Year 2006-07

Funding of $346,700 for the planning year will be provided by the state allocation of $100,000 one-time only planning funds; $126,000 state funding ($6,300 x 20 FTE); and $120,700 contribution from the college. Use of the funds includes the following:

$ 75,700	Development of curriculum for management, advanced technical, and general education courses for year 1 of the program
$ 110,000	Salary and benefits of administrative staff for overall coordination of the program including: curriculum development, faculty hiring, scheduling of classes, identifying library resources, program marketing, establishing clinical sites, advising and enrolling first cohort of students
$ 10,000	Student service staff support to develop and implement admissions processes, student tracking, records and student support.
$ 38,000	Development of library collection for program including purchase of library collection and salary/benefits of library staff
$ 10,000	Marketing and advertising of the program including development and printing of promotional materials
$ 85,000	Equipment and software for program administration, technology for synchronous delivery of instruction, and specialized software for health care management courses
$ 3,000	In-state travel to clinical sites
$ 10,000	Redesign of computer data student management and reporting systems
$ 5,000	Personal service contracts for outside program consultants in curriculum and assessment
$346,700	**Total**

Three-Year Budget

The budget and notes on the following pages show program expenditures for the first three years of the program along with revenue from state support, tuition, and a direct contribution by the college.

	Program Year 1 2007-08	Progam Year 2 2008-09	Program Year 3 2009-10	Budget Notes (see below)
EXPENSES:				
I. Salaries & Benefits				
A. Program Administration				
Program Chair (50%)	$ 37,345	$ 37,345	$ 37,345	(IA)
Administrative Assistant (50%)	$ 16,868	$ 16,868	$ 16,868	(IA)
B. Instruction				
Full Time Faculty	$ 64,559	$ 104,337	$ 104,337	(IB)
Part Time Faculty	$ 20,700	$ 44,466	$ 44,466	(IB)
C. Curriculum Development				
Faculty	$ 92,160	$ 14,000	$10,000	(IC)
On-line Development Specialist (40%)		$ 22,800	$ 22,800	(IC)
D. Librarian (10%)	$ 3,700	$ 3,700	$ 3,700	
E. Student Services Support				
Admissions Coordinator (50%)	$ 16,377	$ 16,377	$ 16,377	(E)
PT Hourly	$ 5,000	$ 10,000	$ 10,000	
F. Prior Learning Assessment	$ 2,000	$ 3,000	$ 3,000	(IF)
G. Program Assessment		$ 4,000	$ 4,000	(IG)
H. Benefits: (32%)	$ 82,787	$ 88,606	$ 87,326	
II. Goods & Services				(II)
Library Collection & Subscriptions	$ 5,000	$ 5,000	$ 5,000	
Printing & Marketing Material	$ 10,000	$ 10,000	$ 13,000	
Room Rental for ITV at Remote Sites	$ 5,940	$ 11,880	$ 11,880	
Coordination of Remote Site Classes	$ 8,700	$ 17,400	$ 17,400	
III. Hardware & Software	$ 6,000	$ 22,000	$ 22,000	(III)
IV. Travel	$ 3,000	$ 4,800	$ 4,800	(IV)
V. Employee Professional Development	$ 8,750	$ 14,000	$ 14,000	(V)
VI. Personal Services Contracts	$ 5,000	$ 3,500	$ 4,000	(VI)
Subtotal:	**$ 393,886**	**$ 454,079**	**$ 452,299**	
TOTAL EXPENSES:	**$ 393,886**	**$ 454,079**	**$ 452,299**	
REVENUE:				
State Funding (20 FTE @$6,300)	$ 126,000			
State Funding (40 FTE @$6,300)		$ 252,000	$ 252,000	
Tuition State (20 FTE x $4,100)	$ 82,000			
Tuition State (40FTE x $4,100)		$ 164,000	$ 164,000	
Application Fees ($125/student)	$ 12,500	$ 12,500	$ 12,500	(VII)
College Contribution	$ 173,386			(VIII)
	$ 393,886	**$ 428,500**	**$ 428,500**	
CONTINGENCY FUND	**$ -**	**$ 25,579**	**$ 23,799**	
BALANCE:	**$ 0**	**0**	**0**	

Budget Notes:					
Expenses:					
I. Salaries & Benefits					
A. Program Administration					
Program Chair - 50% administrative, 50% instruction					
Administrative Assistant - 50%					
Student Services Specialist - 50%					
B. Instruction					
2007-08 - 1.1 FTE for management and general education courses (10 five-credit course sections); .6 FTE for advanced technical courses (9 three-credit course sections)					
2008-09 - 1.77 FTE for management and general education courses (16 five-credit course sections); 1.2 FTE for advanced technical courses (19 three-credit course sections)					
2009-10 - 1.77 FTE for management and general education courses (16 five-credit course sections); 1.2 FTE for advanced technical courses (19 three-credit course sections)					
C. Curriculum Development 2007-08:					
2007-08 - Development of courses for Program Year 2; all courses developed in distance learning format 6 five-credit courses ($6,400/course); 14 three-credit courses ($3,840/course)					
2008-10 - Faculty updating of curriculum					
2008-10 - On-line development specialist to move courses to integrated web-based, live meeting format					
E. Duties include admissions, records, student tracking, and financial aid					
F. Faculty stipends for assessing and granting credit for student prior learning					
G. Program Assessment - implementation of assessment plan including student surveys, industry focus groups, faculty surveys, analysis of program data, internship evaluation					
II. Goods & Services - Includes library collections and subscriptions; printing of marketing materials, program admissions information, student handbook, and course materials; room rental at four remote sites for ITV classes; faculty coordinators at four ITV sites)					
III. Hardware & Software					
2007-08 - computers for program staff					
2008-10 - computers for program faculty/staff; hardware and software for health care management courses & distance learning capability					
IV. Travel - staff travel to clinical sites; travel for program chair and faculty to attend national radiation science & baccalaureate program conferences					
V. Employee Professional Development - faculty/staff attendance at radiation science & baccalaureate conferences					
VI. Personal Services Contracts - consultants for curriculum development and external review of program					
Revenue:					
VII. Application Fees - processing of applications for 100 program applicants per year					
VIII. College Contribution - from one time only funds available at the college					

Adequacy of Facilities and Equipment

The bachelor's program will be taught on evenings and weekends and via distance format, as requested by employers and students, so the BAS program will be able to use classrooms and equipment used by BCC's existing four programs feeding into the degree. Office space has been planned in the new science building which will be completed by 2008. Until then, BCC will allocate temporary space for program staff with current program faculty and staff.

The associate degree feeder programs have a longstanding and successful track-record of working with industry partners at clinical sites. Hospitals and clinics have voiced their support of increased use of their facilities for the bachelor's practicum courses for advanced technical training involving hands-on practice on radiation and imaging equipment. This industry participation also represents a major in-kind contribution by the health care industry in support of the program. (Appendix 7)

Library Media Center

Funding for library staffing has been identified in the budget, and $38,000 has been allocated to increase the core collection for the bachelor's program, based on estimates of need by the library staff. Beginning in 2007, $5,000 per year will be earmarked for subscriptions to professional journals to add to the already well developed library collection that supports the associate level allied health programs. BCC's branch campus agreement with Eastern Washington University provides access for all BCC students to Eastern's collection. In addition, BCC has an agreement with regional hospitals for students in the allied health associate programs to use their libraries, and this will be extended to the bachelor's program.

Distance Instruction

The college has made a significant investment in the creation and use of educational technologies throughout the institution, and particularly in its Distance Education program. The Faculty Resource Center assists faculty in curriculum development and converting courses to an online format. The new bachelor's program will utilize these services beginning with hybrid and other distance formats. By the second year the program will expand distance courses to serve students throughout the state, including remote instructional sites. Funding has been allocated in the budget to develop this expanded educational mode.

Principle: Capacity & Sustainability	
Criteria 3.B	**Standards**
Has analyzed the faculty/staff needed, the education and professional experience qualification of faculty members relative to teaching assignments, and anticipated sources of qualified faculty and staff.	**Requirement:** Describe the number and characteristics of staff and faculty needed for the components of the program (the major, general education courses and electives). For faculty identify the highest level of education needed and describe other experience expectations.

To determine the desired traits for BAS employees BCC reviewed job characteristics at BCC and at four-year colleges and consulted the requirements for faculty identified by the professional associations. BAS faculty will be paid on the current salary schedule and will carry a faculty load within the guidelines of the BCC faculty contract.

The following chart provides a snapshot of the BAS faculty and staff requirements. All employees are expected to have a demonstrated ability to relate to individuals of diverse ages, backgrounds, and abilities and effective communication and team-building skills.

Area	FTE Year 1	FTE Year 2	Characteristics	Minimum Education	Full-Part-time
Health Care Management faculty	.66	1.11	Demonstrated experience in subject area; 2 years' administrative experience, preferably in health care management; at least 2 years' college level teaching experience, preferred; curriculum design experience, preferred; student advising experience, preferred.	Master's degree in health care, business, or a related field	Both
Advanced Radiation and Imaging Technology faculty	.6	1.2	Current practitioner in field, holding advanced certification; minimum 3-5 years' experience working in a clinical setting; curriculum design experience, preferred; two years' teaching experience, preferred.	Bachelor's degree required, master's or professional degree preferred	PT
General Education faculty	.44	.66	Subject competency; teaching experience in subject area; perspectives and experiences that contribute to diversity, breadth, depth and academic faculty excellence; engagement with members of the discipline via publications, conference participation, etc; philosophy of education appropriate to a community college; experience with innovative teaching and learning strategies and outcomes assessment; commitment to student success.	Masters' degree or greater in subject area	FT
Faculty Program Chair	Planning year – 1.0 FTE First year - .5 FTE as program chair and .5 FTE teaching	.5 as pgm chair and .5 as faculty	3-5 years' health care practitioner experience; minimum 2 years' administrative experience in education or health care; experience establishing/ promoting collaborative relationships in health care communities/ educational institutions; budget management experience; 2 years' teaching experience at college level, preferred; experience in student advising, curriculum design and program development, preferred; marketing experience, preferred.	Advanced academic degree in related field (doctorate preferred); Appropriate professional degree with current certification in one clinical modality	FT
Admin. Assistant	.5 FTE		Two years' work experience, preferably in education; experience advising students/ public; ability to work and make decisions independently; experience with program organization, monitoring and scheduling activities; budget monitoring/maintenance experience; proficiency with office software.	High-school diploma	PT
Admissions Coordinator	.5 FTE		Two years' work experience preferably in student services setting; ability to provide accurate information on BAS admission/ registration process/ program; excellent customer services skills; ability to work and make decisions independently; knowledge of SMS; pref.	High-school diploma	PT

Principle: Capacity & Sustainability:	
Criteria 3.C	**Standards**
Has or can readily engage faculty appropriately qualified to develop and deliver a high quality curriculum at the bachelor's level.	**Requirement:** Document that by fall 2007, the current faculty reassigned to the program, plus the faculty hired using the new FTE funding, will have the background consistent with the above analysis plus recent work experience in the field (minimum of two years at a job appropriate for those with at least the bachelor's degree). Faculty and administrators responsible for technical courses must meet certification requirements for professional-technical administrators and instructors http://www.sbctc.ctc.edu/workforce/docs/FinalCertificationWACs2004.doc **For a stronger proposal:** Additionally, document that faculty assigned to the program will have teaching experience in the field.

BCC faculty were commended in the college's recent accreditation site visit for being highly qualified to teach in their fields; for their commitment to the development of innovative academic programs; and for their many efforts to improve pedagogy and refine curriculum. BCC currently has 54 PhD's on staff; some of whom have agreed to teach the program's general education and health care Management courses (See chart below). BCC will reassign some existing faculty and hire new faculty with appropriate experience and credentials, where necessary, to be ready to teach fall 2007. BCC has four strong allied health programs from which to draw part-time faculty, to teach advanced professional-technical courses. These individuals are working professionals in regional hospitals and medical centers. In addition, the University of Washington Masters in Health Administration Program has offered to work with BCC faculty on curriculum to assure that graduates of this program will be fully accepted into their corresponding master's program.

The program chairs for Radiologic Technology, Diagnostic Ultrasound, Radiation Therapy and Nuclear Medicine have a combined eighty years experience in teaching and advising in their programs, and three hold master's degrees; as well, all hold terminal degrees in their fields. They are developing the curriculum for the new program and will be actively involved in student and faculty recruitment, mentoring, advising, retention strategies, and job placement. Two of the program chairs have previously taught in similar bachelor's programs.

BCC has an excellent history of recruiting highly qualified individuals to teach in its professional-technical programs. The college has developed four new certification programs in allied health fields in the past two years and has attracted outstanding faculty. The college conforms to its professional standards policy, which affirms WAC 131-16, and maintains a high standard of excellence in all its professional-technical programs.

Program faculty identified, to date, are shown in the following chart.

Name	Credentials	Employer	Teaching Experience	Area of Expertise and/or Oversight	Recent Work in the Field
General Education Faculty					
Rebecca Baldwin	MA	BCC	15 yrs	Economics of Health Care	
Sandy Rock	MD,	BCC	5 yrs	Biomedical Ethics	✓
Alan Yabui	Ph.D.	BCC	12 yrs	World Cultures	
David Stacy	M.A.	BCC	19 yrs	Math 130	
Health Care Management Faculty					
New faculty/chair				Capstone and others	
Frank Hatstat	JD, MBA	BCC	3 yrs	health care management	
Judy Woo	Ph.D.	BCC	15 yrs	Finance & health care management	✓
Advanced Radiation and Imaging Technology Faculty					
Ron Radvilas	MS, RT(R)	BCC	25 yrs – BCC, 5 yrs City U	Radiologic Technology	✓
Julius Armstrong	MBA, RT(T)	BCC	20 yrs – BCC	Radiation Therapy	✓
Jennifer Prekeges	MS, CNMT	BCC	20 yrs – BCC, Seattle U	Nuclear Medicine Technology	✓
Kathy Olson	BA, RT(R)	BCC	10 yrs – BCC, Gateway CC	Diagnostic Ultrasound	✓
John Harley	MD	Veterans Admin. Med Ctr	UWMC	A&P, Interventional Radiology.	✓
Marc LaCrampe	MD	Virginia Mason Med Ctr		MRI/CT	✓
Eric Taylor	MD	Evergreen Med Ctr	20-yrs – BCC	Radiation Oncology	✓
Michael Hunter	MD	Evergreen Med Ctr	20-yrs – BCC	Radiation Oncology	✓
Maurya Radvilas	R.T.(R)(MR)(CT)[12]	Virginia Mason Med Ctr	20 yrs – BCC	Pathophysiology	✓
Mario Ramos	R.T(R)(CT)[12]	UW Medical Center	3 yrs – BCC	CT	✓
Kelly Yadon	R.T.(R)(IR)[12]	Valley Medical Center	5 yrs – BCC	Interventional Radiolology	✓
Michael Coles	R.T.(R)(MR)[12]	First Hill Diagnostic Imaging	2 yrs – BCC	MR	✓

[12] Because some expert practitioners do not hold advanced degrees, the college will use both master instructors and guest lecturers for these classes. The master instructors will hold advanced degrees (including several with MD's). The guest lecturers are subject experts and meet the teaching credentials required by the Joint Review Committees on Education in Radiologic Technology, Nuclear Medicine Technology, and Diagnostic Medical Sonography.

Principle: Maintain 2-Year Focus	
Criteria 4.A	**Standards**
Has an adequate and appropriate student services plan	**Requirement:** Describe the services that will be needed by the students admitted to the applied bachelor's degree program, and plans for providing those services. Include a description of the following items in the plan: • provision of student financial aid services for students admitted to the program • effective academic advising that engages disciplinary expertise • retention strategies to enhance success of students in the program • how to assist program graduates with placement

BCC is committed to the open door, student diversity and student success. BCC will maintain its focus as a community college, throughout all of its programs and services, as it adds this new bachelor's degree. The applied bachelor's degree program is consistent with the college's mission and goals statement in that it addresses the workforce needs of the community.

The staff in student services currently provides baccalaureate support to students enrolled in Eastern Washington University @ BCC, so the staff is knowledgeable about and has experience in providing services that are needed and is prepared to expand these services to accommodate the new BAS program students. For areas of baccalaureate services that BCC does not currently provide, college staff will be trained in the rules, regulations, and policies governing four-year programs and how they apply to their areas of expertise. Students in the bachelor's program will have access to all of the college's student services. A half-time student services specialist will be added to the staff to assist with the services needed (see Standard 3.B) and the specific needs for part-time hourly assistance will be determined during the planning year.

The following is a current assessment and status of anticipated services for bachelor's students.

Financial Aid	The Financial Aid Office currently employs a staff of ten for rapid processing of aid applications; students can monitor the process of their application online. The financial aid director has investigated financial aid requirements for the bachelor's degree and the existing process is sufficient to prepare and disburse federal, state, and institutional aid. Eligibility criteria as established by federal and state guidelines will remain the same as will the application processing. Contact with the HECB State Need Grant Program (SNG) director has been made, and no problems are anticipated. The SNG director has stated that students in BCC's BAS program will be eligible for the same amounts as third and fourth year students who attend regular bachelor's institutions. The BCC Foundation is raising funds for bachelor's student scholarships so that financial hardship will not be an impediment for those wanting to enroll in the program. In addition, many employers have indicated they will provide tuition assistance.
Academic Advising	The program chair and faculty who have substantial expertise in the major will conduct academic advising and educational planning. They will work with each student individually to develop a specific schedule and advising plan. Students can use internet advising services and degree planning worksheets to access information they need. The Online Student Credit Audit Review (OSCAR), developed at BCC and soon to be used by many colleges in the state, will be updated locally to include the bachelor's degree curriculum. This web tool helps both faculty advisors and students evaluate, monitor and track the student's progress toward completion of a degree.

Student Retention and Success	Student retention and student success are the college's top priority. The four feeder programs at BCC have a combined retention rate of 94 percent, and the college wants to continue and improve this with the bachelor's program. BCC's excellent Science Study Center is open on a drop-in basis to assist with math or science tutoring and study. The math lab, writing lab, and free tutoring services also assist students. Bachelor's level tutors will work with students in subjects where they need assistance. Program faculty will work with students who may need additional assistance to develop personalized student success strategies.
Job Placement	Providing help with career advancement and job placement will be priorities for the new BAS. BCC's feeder associate degree job placement rate is nearly 100 percent. The BAS will provide an ideal career ladder, and it is anticipated that most BAS students will assume leadership roles in their departments once they have finished the program. Others who wish to change jobs will have access to the college's effective employer network.
Credentials Evaluation	BCC employs four full-time credentials evaluators, who have extensive experience evaluating transcripts from accredited community and technical colleges and bachelor's institutions across the United States. They will evaluate incoming students for compliance with admission standards and will evaluate student records when they ready to graduate for general transfer courses, general education and degree requirements. Program faculty will evaluate all transfer or prior learning requests for program courses for radiation and imaging.
Disability Support Services	Disability Support Services has a full staff to provide assessment and accommodations for BAS students with documented disabilities. They provide testing space, coordinate testing for disabled students and assist faculty to provide appropriate accommodation.
Multicultural Student Services	Multicultural student services will offer advising and mentoring, tutoring, emergency financial assistance, and support for the BAS multicultural student population.
Online Services	Bellevue Community College employs a full complement of online services to assist students, including admissions, book store, records and grades, registration services, advising, communication with faculty, and library services, among others. These services will be evaluated and enhanced, if necessary, during the planning year to ensure they accommodate BAS student needs.
Student Support Services (TRiO)	TRiO provides academic and personal support to students who are first-generation college, low-income, or have a documented disability. Services include tutoring, study skills, advocacy, laptop computer lending, activities and transfer assistance. The Department of Education has approved extension of this program to all bachelor's students who fit eligibility criteria.

Principle: Maintain 2-Year Focus	
Criteria 4.B	**Standards**
Has a plan for the assessment of student achievement and program assessment at the bachelor's level built upon a track record of effective assessment of the associate degrees.	**Requirement:** Describe methods for assessment of student achievement and program assessment for the related applied associate degrees and provide examples of how those assessments have been used to improve the program. Describe which parts of that assessment will be applied at the bachelor's levels and the plans for other assessments at that level.

Assessment for the proposed BAS program will build upon the comprehensive five-level student achievement and program assessment processes already in place at BCC. These five levels include: a set of Institutional Performance Indicators, the Program Effectiveness Process (PEP), the Five-Year Program Review, annual CAAP testing (College Assessment of Academic Proficiency), and the Authentic Assessment of General Education (Appendix 13) will be extended to the level expected of a bachelor's program and others will be developed and implemented as needed, working closely with industry reviewers and an external independent consultant from a four-year institution that offers a related bachelor's program. The Curriculum Advisory Committee will provide an efficient, fair, yet rigorous, process to ensure consistency and quality in the college's course and program offerings and the Office of Institutional Research will regularly provide data to improve planning, effectiveness, assessment, and decision-making.

In the report for BCC's 2005 re-affirmation of accreditation, the evaluation team commended Bellevue Community College for its outstanding planning, effectiveness, and assessment processes, concluding that "BCC engages in ongoing planning to achieve its mission and goals and through its planning process, the institution asks questions, seeks answers, analyzes itself, and revises its goals, policies, procedures, and resource allocation." The evaluators further stated that "A culture of assessment for making continuous improvements to courses and programs is part of the climate of BCC."

Radiation and Imaging Technology Two-year Degree Program Assessment

Assessment of student achievement in the 2-year programs: In addition to a wide range of classroom assessments, the students are required to complete a clinical practicum that is an integral part of the curriculum. All of the associate degree programs are competency-based and students must demonstrate their abilities and knowledge in a wide variety of clinical procedures on a daily basis. In addition, the programs, and the students enrolled in them, will be part of the Authentic Assessment of General Education, applied to the baccalaureate degree level.

Program assessment in the 2-year programs involves the identification of quantitative and qualitative measures established with input from students, industry, and professional organizations. These include student course evaluations, student surveys, employer surveys, results on national board exams, and advisory committee recommendations. All results are reviewed with the advisory committee annually and changes are made to the program based on the committee's recommendations. Impacts of the changes on program improvement are reassessed using surveys and collection of objective data, such as national exam results.

The following excerpt from the October, 2002 Interim Report for the Joint Review Committee on Education in Radiologic Technology for the BCC Radiation Therapy Program is an example of how assessment is used to make continuous improvement in all of the programs.

Does the program describe quantitative outcomes consistent with its mission and goals?
For the last five years, the program has met or exceeded its goals:

- The average course completion rate for students entering the program has been 90 percent.
- One hundred percent of the program's graduates earn an Associates In Arts Degree or a Certificate of Completion in Radiation Therapy Technology.
- All graduates of the program have passed the ARRT certification exam in radiation therapy. Program graduates, for the last five years have a 96 percent pass rate.
- During the past five years, the job placement rate for the program's graduates is 89 percent.

Does the program describe qualitative outcomes consistent with its mission and goals?

Course evaluation, instructor evaluation, graduate and employer surveys indicate that students are satisfied with the program and that employers are satisfied with our graduates. The instructor evaluations and surveys are reviewed by program faculty and committee members. These instruments of evaluation are used to identify areas of the program where change would be beneficial to the students.

Do outcome assessment procedures evaluate achievement of the program's mission and goals?
Program outcomes are evaluated in a number of ways, including attrition rates, registry results, employment of graduates, graduates' achievements and survey instruments. Courses and instructors are evaluated by students. Graduates and employers are surveyed. These instruments are reviewed by program faculty and committee members and the curriculum is designed and revised according to results.

Does the program correlate evaluation/planning processes to identify priorities for improvement?
The program utilizes data from assessment of the program's goals to affirm or improve effectiveness. The program uses data received from graduates and employers. After review and tabulation of the data by the program director or clinical coordinator the information is presented to the committee for further review and suggestions. Examples of changes initiated by this process are:

- Results of national certification examination, 100 percent pass rate.
- Review of the scores on the national certification exam indicated that improvement in the patient care section was desirable. Changes in the curriculum were implemented. After the changes were implemented, review of the scores of the national certification exam, demonstrated improvements.
- Review of graduate and employer surveys showed a need to increase the students' simulation experiences. Simulator rotation goals were modified and more clinical labs were added to the curriculum and learning objectives for simulation techniques were developed and incorporated.

Proposed Radiation and Imaging Sciences BAS Program Assessment Plan

In addition to the ongoing assessment and effectiveness processes in place for all educational programs at BCC, a specific assessment plan will be developed and implemented for the proposed BAS program and the program faculty and staff will evaluate program success against identified program outcomes.

Industry will be closely involved in the ongoing review of the curriculum through advisory committee and expert review processes. Outside evaluators from industry and education will be engaged in the curriculum development and implementation phase to ensure rigor of the content and learning methodologies.

The following presents a summary of the draft assessment plan for the BAS program. For more details please see Appendix 14. The proposed assessment plan builds and expands on the existing BCC assessment processes, and includes the following elements:

- **Survey of student profile at entry into the program** to gain an understanding of the student population served by the program
- **Ongoing assessment of the effectiveness of curriculum/ program** to help refine the curriculum and program design, including discipline-based, general education and electives using the same rubric format that BCC uses to measure general education outcomes in the associate degree program
- **Oversight by a BAS Industry Advisory Committee** to provide ongoing support and review of the BAS program

- **Graduate follow-up and industry feedback surveys** including placement rates, career advancement and salary improvement to assess effectiveness of program in meeting career goals and employer expectations
- **Survey of faculty satisfaction** to assess adequacy of program support and faculty training
- **Assessment of the impact of the BAS program on the existing two-year programs**
- **Assessment of impact of BAS program on BCC resources/ administration.**

Criteria 5.A	Standards
Has a plan for selective admissions processes, if used for the bachelor's program, consistent with an open door institution	**Requirement**: Describe the program selection and admissions process (how this process relates to and supports the open door.) Also, describe efforts to assure that the CTC bachelor's serves as diverse a population as enrolled in the relevant associate degree programs in terms aspects of diversity important to the college community

In developing its criteria for admission to the BAS program, BCC has adhered to its open door mission by making the minimum requirements as broad as possible while ensuring that each student has the appropriate background to succeed in the bachelor's level work through appropriate general education preparation and national certification in his or her technical field.

Serving diverse pop?

Individuals with a wide range of backgrounds will be eligible to participate in the applied bachelor's program. It will be open to graduates of four different allied health technology programs, as well as those who have gained their entry-level credential via a certificate program or on the job training. The college expects to admit fifty students in each cohort to fulfill its obligation for 40FTE. Many incoming part-time students will have already taken some advanced technology courses, enabling them to complete their degree within two years.

BCC is committed to student diversity. The BCC allied health associate programs employ recruitment measures to bring diversity to their student populations. As of fall 2005, the combined average diversity of the four programs was 22 percent and six percent Hispanic students.

Admission Criteria for the BAS in Radiation and Imaging Sciences

The following prerequisites will ensure that each incoming class is well prepared to begin bachelor's studies, regardless of the origin of their preparation.

Applicants for the program must have ***both***:

a) Certification (via national exam) in radiologic technology, radiation therapy, nuclear medicine technology, or diagnostic medical sonography, and
b) Demonstrated completion of the following courses from an accredited college, with a grade point average of 2.5 or better:
   i. English composition (or assessment beyond that level)
   ii. Intermediate algebra (or assessment into pre-calculus)
   iii. Human anatomy and physiology, 2 courses

iv. Humanities course
v. Social sciences course
vi. General business course

In addition, students will be asked to submit a personal statement, which will be factored into admission decisions, modeled after the process used by the University of Washington, that permits students to plead their case for admission by documenting specific and unique attributes that they will bring to the program. The statement may include information as to how culture will assist the applicant to bring better services to the health care field; how the student's culture has had an impact on the student's life and what he/she has learned as a result; any personal or imposed challenges or hardships the student has overcome in pursuing his/her educational goals; involvement in research, community service, relevant work experience (paid or volunteer) and the ways in which it has contributed to the student's academic career or personal goals; information about advanced professional certification the applicant has achieved; courses beyond an associate degree the student has completed; or other factors the student deems relevant. The college will establish a committee to review the personal statements and identify special attributes or skills that would bring diversity to each cohort and to the work force.

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The college's plan is to admit applicants who successfully fulfill these admission criteria on a first come, first served basis, with some consideration given to unique attributes of applicants and a proportionality formula that ensures that applicants from all feeder colleges are given an opportunity to participate, like those that college currently have with branch campuses. The college will refine and formalize its admission process during the planning year with assistance from the University of Washington and the college's AAG.

Conclusion

Bellevue Community College requests approval from the State Board for Community and Technical Colleges for its proposal to offer a Bachelor's of Applied Science in Radiation and Imaging Sciences. The college is well positioned to create a successful pilot for the state based on the many points that have been detailed in this proposal. This degree will help respond to industry needs and better prepare students with education and skills that fill identified employment gaps, provide a pathway to further education, and benefit place bound students in the state.

Hotlinks to Appendices and Other Pertinent Items

Appendix 1	Employer Surveys
Appendix 2	Focus Group Agenda And Minutes
Appendix 3	Student Surveys
Appendix 4	Employee Surveys
Appendix 5	Letters Of Support From College Presidents and Program Chairs
Appendix 6	Letter Of Support From UW School of Public Health
Appendix 7	Letters of Support from Healthcare Employers, Professional Societies and Community Organizations
Appendix 8	Comparison Table of Four Different Bachelor's Programs
Appendix 9	List of BAS Elective Courses
Appendix 10	Four-Year Curriculum Maps for Associate Degree Students in the BAS Program
Appendix 11	BAS Alignment with BCC Graduation Requirements and General Education Requirements for EWU
Appendix 12	Management Course Outcomes
Appendix 13	Description of BCC Assessment Methods
Appendix 14	BAS Assessment Plan

Vitae for External Experts

Jeff Lewis, Supervisor, Technical Services and First Hill Clinical Site Supervisor, Swedish Cancer Institute

Richard R. Carlton, M.S., R.T. (R), (CV), FAERS, Director, Associate Professor, Radiologic and Imaging Sciences, Grand Valley State University

Websites for BCC Feeder Associate Degree and Certificate Programs

Radiologic Technology

Diagnostic Ultrasound

Radiation Therapy

Nuclear Medicine

Interviews With 22 Community Colleges Who Offer Applied Baccalaureate Degrees

Mission and Role Discussion of 22 Community Colleges Who Offer Applied Baccalaureate Degrees

WASHINGTON
HIGHER
EDUCATION
COORDINATING BOARD

July 2006

Bachelor of Applied Science in Radiation and Imaging Sciences – Bellevue Community College

Introduction

Bellevue Community College (BCC) is seeking Higher Education Coordinating Board (HECB) approval to offer a Bachelor of Applied Science in Radiation and Imaging Sciences (RIS). Bellevue Community College is one of four colleges selected by the State Board for Community and Technical Colleges through a competitive process to develop a baccalaureate level program designed to provide a baccalaureate pathway for students who receive an associate degree in an applied field.

The Radiation and Imaging Sciences program is being proposed in response to increasing complexity of the field, changing employer preferences, and a need for qualified managers. With implementation of the RIS program, BCC would be the only institution in Washington to provide students who received initial training at the associate level a pathway to the baccalaureate degree within the discipline.

Relationship to Institutional Role and Mission and the Strategic Master Plan

The primary mission of Bellevue Community College is to provide high quality and flexible education programs that are consistent with the needs of students and which support the economic, social, and cultural needs of the community. The program is responsive to this mission by providing career advancement opportunities to graduates of the BCC programs and other programs in the state. In addition, the program would contribute to the community by preparing well-qualified healthcare workers.

The program goals are consistent with those of the *2004 Strategic Master Plan* in that they provide opportunities for students to earn degrees and respond to the state's economic needs. The proposed degree program would respond to changing demand within the healthcare industry. Specifically, the program would meet the individual needs of students by providing access to a degree program that would enhance their skills and provide for career advancement. More broadly, the program responds to the economic needs of the state by providing a trained workforce for a key economic sector.

Program Need

The proposal responds to needs expressed by students, employers, and community stakeholders. The *State and Regional Need Assessment* (HECB) finds a substantial gap between the supply of prepared graduates in the healthcare programs and projected employer demand for qualified workers. While roughly half the demand for additional training at the baccalaureate and graduate level is in nursing, most healthcare fields show some level of demand. HECB analysis estimates that 33 of the 140 projected annual openings in radiation and imaging technologies would require a bachelor's degree; however, this estimate is based on the current workforce and does not account for changes in employer preferences or other changes leading to a demand for increasing skill levels. The American Registry of Radiologic Technologists (AART) estimates that nearly one third of current technologists will need to upgrade their skills to the baccalaureate level.

Job growth in radiation and imaging occupations is increasing rapidly. Currently, Washington employs 5000 radiation and imaging technologists. The number of positions is expected to grow by 21-35 percent by 2012. In addition, there is a high vacancy rate for positions in the field (5-10 percent). Gaps are also apparent at the supervisory level. Industry surveys indicate that many of the nearly 900 supervisory positions in Washington are filled by under-qualified technologists. The need for supervisors is growing as well with over 300 new positions expected by 2012.

As indicated, changes within the industry are pressing for more workers with increased levels of education. This manifests itself in two key ways. First, is a need to develop managers with an understanding and working knowledge of the various diagnostic imaging procedures. Second, is a preference among employers for workers who hold multiple certifications. According to the U.S. Department of Labor's *Occupational Outlook Handbook,* radiologic technologists who are experienced in more complex diagnostic imaging procedures such as CT or MRI have better employment opportunities, as employers seek to control costs by using multi-skilled employees.

Finally, the American Society of Radiologic Technologists are calling for the bachelor degree to become the entry-level degree for radiation therapists. This recommendation is based on many of the factors listed above as well a belief that the higher levels of education would lead to better patient care. This is a change that is occurring in several other countries. One of the key findings of the ASRT report is that many workers enter the field without all the technical skills expected of them. In addition, the report finds that the more robust general education component at the baccalaureate level better equips professionals "to meet changing needs and circumstances of their occupations"[1].

Student demand for the program is based on statewide surveys of working technologists and students in radiation and imaging technology programs. Nearly 80 percent of the 169 respondents indicated an interest in the baccalaureate program. Currently, BCC graduates 84 students at the associate level per year across four specialty areas within the radiation and imaging sciences. One hundred sixty-one students per year graduate from the six other imaging programs in the state.

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[1] Advancing Radiation Therapy Education and Practice, American Society of Radiologic Technologists. 1999.

The program would also draw students who are currently working in the field. Total employment in radiation and imaging science occupations is over 5000, with a workforce of 1600 in King county alone.

Community demand was assessed using employer surveys, employer focus groups, and letters of support. The employer survey indicated that while the bachelor's degree was not required at entry level, it is required for upper-level management positions; and employers expressed a clear preference for the bachelor's degree for mid-level management positions. More broadly, employers indicated that not enough baccalaureate trained workers were available to meet their organizational needs; and the greatest barrier to moving people into supervisory and leadership positions is finding the time to train them. Employers indicated a desire to hire graduates of the BAS program and to pay to send their workers to the program.

In addition to the survey, BCC conducted a focus group with current supervisors and managers. The focus group confirmed many of the factors discussed above, most notably a trend pressing for higher levels of education and increased complexity of the work. On a more practical note, the group indicated an increased level of compensation for workers who possess a bachelor's degree.

Currently, Seattle University is the only baccalaureate program in Washington that prepares students for certification in radiation and imaging sciences (diagnostic ultrasound). The program does not articulate with the associate level programs, rather it provides a baccalaureate level pathway to initial certification. The BCC program would be the first in the state to offer a pathway for students who have received their initial training at the associate level.

Program Description

The proposed BAS in Radiation and Imaging Sciences would provide a baccalaureate opportunity for students who have completed associate's level training in radiation technology, diagnostic ultrasound, radiation therapy, or completed a certificate in Nuclear Medicine. Graduates would be prepared for certification in higher level diagnostic techniques or to enter management positions.

Students who hold a certificate in one of the specialties listed above and who have completed college level coursework in English composition, intermediate algebra (pre-college), anatomy and physiology, humanities, and social science, would be eligible to apply. Students also must have a cumulative GPA of 2.5 or higher and submit a writing sample and two letters of reference.

Once admitted to the program, students would have the opportunity to specialize in imaging management or imaging technology. In either case, students would be exposed to some coursework in the other specialty; and in all cases, students would complete a set of general education requirements including 15 credits in communication, 15 credits of quantitative reasoning, 15+ credits of natural science (major requirements at the associate level are well beyond the general education requirement), 15 credits in responsibility (ethics, group process, self-assessment), and 15 credits in cultural traditions for a total of 75 general education credits.

Program graduates would gain skills in supervision and management and enhance their technical skills. In addition, graduates would be prepared to enter and complete graduate programs. BCC has been working with the University of Washington Health Administration Program to ensure

their BAS graduates would have the requisite coursework and competencies to successfully enter and complete the Masters in Health Administration. Dr. Will Welton, Program Director for the Master in Health Administration program at the University of Washington, reviewed the curriculum and indicated that graduates of the program would be eligible for entry into the executive MHA program.

In the first year, the program would accommodate 20 FTE (40 headcount) students. The program would grow to approximately 50 FTE (95 headcount) students by the fourth year. The department estimates the program could be as large as 34 FTE students in the first year and could reasonably be expected to grow to 62 FTE students by the fourth year.

The program proposal includes clearly-defined student learning objectives for both the general education component of the program and the program as a whole. During the program, students would be assessed through a variety of mechanisms including their regular coursework, evaluation of the practicum, assessment of a capstone course, and practice-based and knowledge-based assessments.

The program goals are clearly defined and aligned with student learning outcomes. The program is assessed through a number of approaches including typical strategies such as course evaluations, student surveys, graduate follow-up, employer surveys, and analysis of retention and completion data. In addition, the program will survey faculty and conduct focus groups with students.

In addition to the standard student and program assessment, the program is deemed a pilot degree program; the institution will examine the impact of the program on other programs and resources at the college. The SBCTC and the HECB will also be conducting evaluations of the programs. Finally, as the first degree at a new level, the proposed degree program will represent a substantive change that requires review by the Northwest Commission on Colleges and Universities (NWCCU), the regional accrediting body.

Diversity

The proposal identifies strategies to build on the success of existing programs at Bellevue Community College to attract and retain a diverse student body. Specifically, the program would work to recruit graduates of their own associate degree programs with special emphasis on students of color. In addition, the institution would work with local employers and clinical sites to promote the program and recruit students.

External Review

The program was reviewed by three external experts: Dr. Duane Akroyd, Coordinator Health Professions Education Department of Adult and Higher Education, North Carolina State University; and Richard Carlton, M.S., R.T.(R)(CV), FAERS, Grand Valley State University Radiologic and Imaging Sciences.

Both reviewers expressed support for the program citing the need for the program expressed by students and employers as well as the close articulation with the associate level program.

Dr. Akroyd noted a number of strengths in the proposal and reinforced evidence presented in the proposal around the need for additional training to better prepare new technologist and the

difficulties in keeping up with changes within the profession. Akroyd also made two key suggestions: first, would be a tighter admission process; second, would be greater clarity in the specific courses a student would need to receive particular advanced certifications. The program developers responded to these concerns by modifying the admission process to better recognize the need to allow for potentially selective admissions. With regard to advanced certifications: as the curriculum is more fully developed and materials are prepared for students, the specific course sequences will be more clearly identified for students.

Mr. Carlton indicated support for the program, applauding the assessment of student demand and the efforts to articulate the program with other community and technical college programs. Carlton raised a question about "radiologist assistant" programs that are now starting around the country. Those programs are at the baccalaureate as the minimum. The program developers responded that the institution must already have baccalaureate authority in order to develop such a program, and that they do have an interest in adding such a program in the future. Carlton also asked for clarification in the curriculum around the capstone requirement and specific content. The program responded that the capstone was required under either specialization, and the content was indeed incorporated into the coursework outlined in the proposal. Finally, Carlton raised questions about the funding for the library improvements and the funding for the program chair. The program responded that the library funding was appropriate as an addition to the current level of support provided for the two-year programs. With regard to the program chair, the concern that the funding would not be sufficient to attract a doctorate-qualified chair appears to be moot at the moment, as the person is currently employed at the institution.

Program Costs

Prior to the first year of the program the institution would receive planning funds, and no students would be enrolled in the program during the planning year. In the first implementation year of the program with an entering class of 20 FTE students, costs are estimated to be $ 19,269 per FTE. At full enrollment in the fourth year (50 FTE students) the cost would be $8,252 per FTE. The average direct cost of instruction for baccalaureate programs in Health Sciences at the regional institutions is roughly $11,000 per FTE (including 4,500 – 5,200 in indirect cost estimates).

The program would draw on the current faculty. The program estimates a contribution of faculty time equivalent to 1.73 FTE faculty in the first year and 2.96 FTE faculty in the fourth year. Administrative and clericalarosts ased on 1.5 FTE, and 2.2 FTE staff is included for curriculum development and academic support.

The program includes funding for library improvements, including a .25 FTE librarian who would be responsible for the development of the collection for the BAS program. Funding of $38,000 is provided for purchase of books and materials. In addition, $5,000 per year would support professional journals and subscriptions. Funding is also provided for the improvement of the college's core collection. This includes one time funding of $100,000 to improve the collection and an increase in ongoing funding of $25,000 per year. The institution also receives $5,000 from Perkins funding to support the Cumulative Index for Nursing and Allied Health Literature. Finally, students have full access to the Eastern Washington University Library.

Staff Analysis

The proposed program would support the unique role and mission of the institution. The program builds upon a successful set of programs at the associate level. The program is responsive to the needs of employers and to students by providing a pathway that would allow students to continue to build their skills and to prepare for higher levels of expertise and responsibility.

The program also responds to the master plan goals of providing opportunities for students to earn degrees and respond to the economic needs of the state by providing trained workers who are able to respond to change within the industry. The program would create a pathway to the baccalaureate degree for students that do not currently have this option within their professional field of study. As a result of providing access to the bachelor's degree, the program would also open the door to graduate study for these students.

The program is consistent with the purpose of HB 1794 providing an applied bachelor's degree pathway to students who have completed a technical associate degree program and do not have ready access to other bachelor's degree programs.

The proposed degree program includes an assessment approach with well-defined student learning outcomes and multiple measures of student achievement. The program would be subject to a well-defined review process that brings feedback from various constituents. In addition, due to the pilot status of the degree program, the program would be subject to scrutiny from the HECB, the SBCTC, and the NWCCU review processes.

The program responds to demonstrated student, employer and community needs and is consistent with the state and regional needs assessment and the institution's own assessment of need. In fact, the enrollment estimates appear relatively conservative. While a first year class of 20-25 FTE would be reasonable, the program should be allowed to grow to 60 FTE in year four, if student demand allows.

The program would not duplicate existing programs and would be offered at a reasonable cost.

Recommendation

Based on careful review of the program proposal and supplemental sources, board staff recommend approval of the Bachelor of Applied Science in Radiation and Imaging Sciences degree program at Bellevue Community College.

APPENDIX 2: SUPPLEMENTAL PLANNING ASSUMPTIONS AND FOUR-YEAR CURRICULUM MAP

ITEM 1: SUPPLEMENTAL PLANNING INFORMATION

BAS Admission Planning Assumptions

1. During first two years of the program, all students will enter the program having completed Math 130 (Statistics), English 201 (Research Paper) or English 270 (Technical Writing), and GBus 101 (Introduction to Business) – total 15 credits.
2. Each of the two concentrations will enroll 50 percent of admitted students.
3. Seventy-five percent of admitted students will have completed one advanced imaging certification (18 credits) upon entry.
4. Approximately 20 percent of admitted students will have completed two advanced imaging certifications (30 credits) upon entry.
5. Students will take an average number of 8 credits per quarter.
6. Forty students per year will be admitted (20 FTE x 45 credits per year / 8 credits per quarter equals 37.5 students).
7. Priority admission for the first year will be given to students who have completed the 15 credits in (1) above and at least one advanced imaging certification. Also, special consideration will be given to work experience and transfer credits.
8. Students may enroll in available seats on a non-matriculated student basis and accumulate up to 18 credit hours that will be applied to their program when admitted.
9. Some additional students may be admitted each quarter, if needed. Admission assumptions will be evaluated quarterly.
10. BCC will reassess the admission process for years 2 and 3, based on the first year's experience.

Case Scenarios for 4 types of students:

1. **RAIT student** admitted having completed 33 credits (15 credits of Math 130, English 201/270, and GBus 101 and one advanced certification 18 credits)

Fall Q1:	Econ 315 – 5 credits RAIT 410 – 3 credits	Fall Q2:	RAIM 325 – 5 credits RAIT 302 – 3 credits
Win Q1:	Speech 330 – 5 credits RAIT 401 – 2 credits	Win Q2:	RAIM 460 – 5 credits RAIM 303 – 3 credits
Spr Q1:	Phil 365 – 5 credits RAIT 490 – 3 credits	Spr Q2:	RAIM 340 – 5 credits RAIM 401 – 5 credits
Sum Q1:	RAIM 301 – 5 credits	Sum Q2:	RAIM 475 – 5 credits

Total credits for year 1 = 28 Total credits for year 2 = 31
Grand total of 92 credits

2. **RAIT student** admitted having completed 45 credits (15 credits of Math 130, English 201/270, and GBus 101 and two advanced certifications 30 credits)

Fall Q1:	Econ 315 – 5 credits RAIT 302 – 3 credits	Fall Q2:	RAIM 325 – 5 credits
Win Q1:	Speech 330 – 5 credits RAIT 303 – 3 credits	Win Q2:	RAIM 460 – 5 credits

Spr Q1:	Phil 365 – 5 credits	Spr Q2:	RAIT 495 – 5 credits
Sum Q1:	RAIM 301 – 5 credits	Sum Q2:	RAIM 475 – 5 credits

Total credits for year 1 = 26 Total credits for year 2 = 20
Grand total of 91 credits

3. **RAIM student** having completed 33 credits (15 credits of Math 130, English 201/270, and GBus 101 and one advanced certification 18 credits)

Fall Q1:	Econ 315 – 5 credits	Fall Q2:	RAIM 401 – 5 credits
	RAIM 325 – 5 credits		RAIM 350 – 5 credits
Win Q1:	Speech 330 – 5 credits	Win Q2:	RAIM 460 – 5 credits
	RAIM 320 – 5 credits		RAIM 440 – 5 credits
Spr Q1:	Phil 365 – 5 credits	Spr Q2:	RAIM 340 – 5 credits
			RAIM 410 – 5 credits
Sum Q1:	RAIM 301 – 5 credits	Sum Q2:	RAIM 475 – 5 credits

Total credits for year 1 = 30 Total credits for year 2 = 35
Grand total of 98 credits

4. **RAIM student** having completed 15 credits (Math 130, English 201/270, and GBus 101)

Fall Q1:	Econ 315 – 5 credits	Fall Q2:	RAIM 401 – 5 credits
	RAIM 325 – 5 credits		RAIM 350 – 5 credits
Win Q1:	Speech 330 – 5 credits	Win Q2:	RAIM 460 – 5 credits
	RAIM 320 – 5 credits		RAIM 440 – 5 credits
Spr Q1:	Phil 365 – 5 credits	Spr Q2:	RAIM 410 – 5 credits
	RAIM 340 – 5 credits		RAIT 495 – 5 credits
Sum Q1:	RAIM 301 – 5 credits		

Total Credits for year 2 = 35 Total credits for year 2 = 30 credits

Fall Q3:	RAIT 301 – 3 credits
	RAIT 302 – 3 credits
Win Q3:	RAIM 475 – 5 credits

Total credits for year 3 = 11
Grand total of 91 credits

Curriculum Planning Assumptions

1. Average class size is 20.
2. Clinical practicum courses and the capstone course will be taught quarterly by the program chair for his 50 percent teaching load.

	Year 1	Year 2	Year 3	Year 4	Year 5
Max FTES	34	58	62	58	62
Total FTEF	1.73	2.96	3.1	2.96	3.1

3. 40 new students will be admitted every year. There will be a 10 percent attrition rate.

	Year 1	Year 2	Year 3	Year 4	Year 5
Incoming	40	40	40	40	40
Continuing	0	40	61	60	59
Attrition	0	-4	-6	-6	-6
Total	40	76	95	94	93
Graduates	0	15	35	35	35
Remaining	40	61	60	59	58