# CASCADIA COLLEGE

## BOTHELL

# Cascadia College

18345 Campus Way NE
Bothell, WA 98011-8205

Program Proposal

Bachelor of Applied Science
Information Technology Application Development

## COVER SHEET
## NEW DEGREE PROGRAM PROPOSAL

### Program Information

Institution
Name: **Cascadia College**

Degree Name: **BASIT in Application Development -
Mobile Platforms**          CIP Code:  11.0201

Name(s) of existing technical associate degree(s) that will serve as the foundation for this program:

Degree:  AAS-T Web Applications          CIP Code:  11.0201          Year Began:  2000

Degree: _____          CIP Code: _____          Year Began: _____

Planned Implementation Date ( i.e. Fall 2014):          **Fall 2018**

### Contact Information (Academic Department Representative)

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Dr. Rosemary Sutton                    3.1.2017
Chief Academic Officer                    Date

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# Introduction

The objective of Cascadia College's professional technical programs is to create education pathways that prepare students for high demand/high wage careers in our region. The Bachelors of Applied Science in Information Technology (BASIT) Application Development – Mobile Platforms program would build on students' programming and design experience, adding specific knowledge and skills integral to mobile platform development including portable user interface design, localization, cross-platform experience, API development, monetization, along with specific app testing, deployment, and quality assurance over multiple release cycles.

Headlines regarding mobile development tend to be dominated by big names like Microsoft, Google, T-Mobile and Amazon, but our region is also home to many mid-sized organizations with notable successes in this field. Geekwire 200 identifies local companies like Redfin, Tune, Tableau, Uber, and Big Fish Games as key application development players for mobile platforms. In addition, many mid-sized and even small companies without an obvious mobile development focus are finding increased market pressure to create and maintain applications for mobile devices. Dr. Brian Bansenauer, lead faculty for this program, has worked with several mobile application businesses and has a strong understanding of current industry needs and directions.

The most recent Washington State Employment Security Jobs report continued to reflect the strong demand for IT workers in the Puget Sound region. Application Software Developer is consistently rated the highest demand occupation followed by "all other computer occupations" second and Web Developers as number seven; a combined 3,441 "new" job postings were listed in those three categories in the month of December 2016.

Employment reports also consistently list a bachelor's degree as the minimum educational entry point for Application Development work, a point that has been repeated by our Technical Advisory Committee (TAC). An applied bachelor's degree in this field will be a pathway to family wage jobs. In an article published last year the Puget Sound Business Journal reported that tech workers comprised 8.2% of the private sector workforce while earning a salary that was nearly double the average private sector salary average of $55,000. Glassdoor reported an average salary of $91K in the Seattle area for Application Developers.

The Application Development – Mobile Platforms degree will provide an affordable, accessible pathway to jobs for place-bound students in north King County, as well as extending re-training options for computer tech industry professionals interested in pursuing jobs in mobile platform development.

| CRITERIA | STANDARD |
|---|---|
| Curriculum demonstrates baccalaureate level rigor | Describe curriculum including (1) program learning outcomes (2) program evaluation criteria and process (3) course preparation needed by students transferring with technical associate degree (4) general education component (5) course work needed at junior and senior levels in the BAS. |

## Program Learning Outcomes

The Application Development – Mobile Platforms degree prepares students to work as mobile developers in a team-based environment supporting the creation, testing, deployment and maintenance of mobile solutions. Technical threads of learning include:

- App Lifecycle Development - managing development across entire lifecycle including multiple versions
- Team Interaction – including asynchronous and distance environments
- Mobile software Design Patterns
- Security
- UX Design and Testing
- Agile Development
- Version Control
- Scalability and Cloud Computing
- Testing and Continuous Integration
- App Analytics - across devices, usage

The Application Development – Mobile Platforms degree outcomes align with Cascadia's four college-wide Learning Outcomes as follows:

I. **Learn Actively** - Learning is a personal, interactive process that results in greater expertise and a more comprehensive understanding of the world.

   A. Apply a broad understanding of mobile platforms and systems thinking to identify and acquire new knowledge, and develop organizational solutions.

   B. Develop, troubleshoot, and update mobile applications and platforms to meet project objectives and constraints.

   C. Practice effective strategies to manage the design, development, testing, and ongoing maintenance of mobile platforms.

II. **Think Critically, Creatively and Reflectively** - Reason and imagination are fundamental to problem solving and critical examination of ideas.

    A. Identify, analyze, and prioritize stakeholder needs during the selection, creation, evaluation, implementation and administration of mobile technology systems.

    B. Analyze and apply ethical, sustainable, and resilient business practices.

    C. Research trends in mobile development to learn new technologies and keep abreast of changes within the software development profession.

III. **Communicate with Clarity and Originality** - The ability to exchange ideas and information is essential to personal growth, productive work, and societal vitality.

    A. Work efficiently and effectively applying sound teamwork strategies, project management techniques, and professional communication skills.

    B. Engage in continuing professional development, documenting ongoing learning for professional advancement.

    C. Present and clearly communicate design, functionality, technical concepts and constraints to a range of technical and non-technical stakeholders.

IV. **Interact in Diverse and Complex Environments** - Successful negotiation through our increasingly complex, interdependent and global society requires knowledge and awareness of self and others, as well as enhanced interaction skills.

    A. Collaborate effectively in multi-disciplinary, diverse teams, in-person and virtually, using tools and strategies that support cooperative software development practices.

    B. Analyze the local and global impact of mobile technology on individuals, organizations, and society.

    C. Conform to legal and regulatory standards, and apply appropriate ethical considerations including respect for security, privacy, and intellectual property.

**Program Evaluation Criteria and Process**

Assessment of the Application Development – Mobile Platforms degree is based on the ongoing, comprehensive student achievement and program assessment process for all programs at Cascadia.

Program review occurs on a four-year cycle and assesses all aspects of every program. Cascadia is committed to the success of this degree and will review it annually for the first three years. This will include the development of a program "dashboard" that

tracks program specific data such as FTE and headcount, retention rates, course pass rates, part-time and full-time faculty ratios. The Technical Advisory Committee (TAC) will also play a significant role in providing feedback on the curriculum and evaluation of the curriculum and program budget. The college plans to grow the existing TAC for Web Applications by an additional four members. The expanded group will provide program evaluation and guidance for the two- and four-year degree programs. The TAC is expected to provide input on curriculum improvements; ensure that the curriculum is adapting to changes within the field; and assist with the identification and development of placement opportunities for interns and graduates.

The lead program faculty will collaborate with the college's institutional researcher to assemble annual data about the program and develop the program dashboard. The lead program faculty will work with the Dean for Student Learning to determine the overall effectiveness of the courses in their relation to the program outcomes and student satisfaction with a final report being delivered to the VP for Student Learning and Success Services.

Table 1 provides a summary of methods used to assess the program

*Table 1: Program Assessment Methods*

| Effectiveness of Curriculum and Program | |
|---|---|
| Course evaluations completed by students | • Effectiveness of teaching methods and curriculum |
| Project Fair Presentations | • Assessment of student learning |
| Student surveys and/or focus groups | • Effectiveness of course and program design<br>• Helpfulness of and/or need for student services |
| Program statistics | • Applications, acceptance and enrollment (FTE and headcount)<br>• Course pass rates<br>• Student progression and retention |
| Faculty Survey | • Preparation of entering students<br>• Successful attainment of learning outcomes |
| Graduate Survey | • Assessment of program depth<br>• Employability |
| **Industry Feedback and Recommendations** | |
| Technical Advisory Committee Feedback | • Review feedback from project fairs<br>• Annual review of student progression and curricular updates<br>• Evaluation of quality and scope of student work in relation to industry expectations |
| Biennial industry focus group | • Every two years, comparison of overall curriculum in relation to industry needs |

| Effectiveness of Curriculum and Program | |
|---|---|
| Intern Assessment | • Employer feedback on student performance during internship |
| Capstone presentation | • Evaluation of capstone content and presentation |

## Course Preparation needed by students transferring with a technical associate degree

The Application Development – Mobile Platforms degree provides pathways for students with a technical associate's degree in Computer Science or other IT-related fields to graduate in two years of full-time study. Students must demonstrate preparedness for rigorous academic and technical work and meet the following criteria:

1. An associate's degree (90 credits or more) from a regionally accredited college or university in the area of Computer Science or Information Technology.

2. Minimum 2.5 cumulative G.P.A.

3. Minimum 2.0 G.P.A. in each of the following courses:
   • College-level Mathematics with intermediate algebra as a prerequisite
   • College-level English (ENGL&101 or equivalent)
   • College-level Humanities
   • College-level Social Sciences
   • Web or mobile foundations with a design component equivalent to Cascadia's BIT (Business Information Technology) 113
   • Database foundations course equivalent to BIT 275
   • Programming II course equivalent to BIT 143

## General Education Component

The General Education courses, outlined in Table 2, meet the SBCTC's requirements for general education distribution for BAS degrees: communication skill (10 credits), quantitative/symbolic reasoning (5 credits), humanities (10 credits), social sciences (10 credits), and natural sciences (10 credits), plus an additional 15 credits.

Of the 60 credits outlined, student will likely earn 20-25 credits as part of their two year AAS-T and the remaining credits during their BAS program. Students transferring from other institutions will have their transcripts evaluated; courses with equivalent content will be reviewed in consultation with faculty and approved by Enrollment Services.

*Table 2: General education distribution*

| Area of Study | Course | Credits | Typical Completion |
|---|---|---|---|
| Communication Skills (10 credits) | ENGL&101 – English Composition | 5 | AAS-T |
| | ENGL&235 – Technical Writing | 5 | BAS |
| Quantitative Reasoning (5 credits) | College-level Math course* | 5 | AAS-T |
| Humanities (10 credits) | ART 110 – 2-Dimensional Design | 5 | AAS-T/BAS |
| | HUM 330 – Design Research Methodologies | 5 | BAS |
| Social Sciences (10 Credits) | Social Science course with a Global Studies designation from the distribution list | 5 | AAS-T |
| | SOC 440 – Computers, Ethics & Social Change | 5 | BAS |
| Natural Sciences (10 Credits) | Any two Natural Science classes (One must count as a lab) | 10 | BAS |
| Additional 15 Credits** | BUS&101 – Introduction to Business | 5 | AAS-T |
| | CMST&105 – Communication in Orgs | 5 | AAS-T |
| | Elective, recommend BIT 265 – Structures & Algorithms (carries transfer designation) | 5 | AAS-T/BAS |
| TOTAL GEN ED | | 60 | |

\* Students intending to pursue an MS in Computer Science at University of Washington, Bothell would need to take Calculus I
\*\*Cascadia Catalog http://www.cascadia.edu/academic_resources/documents/Catalog_16_17final_7_13.pdf

## Coursework needed at junior and senior levels in the BAS

The Application Development – Mobile Platforms degree requires a minimum of 180 credits with the first 90 credits transferred from the technical associate's degree. The remaining 90 credits include 30 general education credits and 60 core technical credits.

*Table 3: BAS Course Requirements at Junior and Senior Levels*

| Area of Study | Course | Credits |
|---|---|---|
| General Education (30 credits) | Technical Writing (ENGL&235) | 5 credits |
| | Structures and Algorithms (BIT 265) | 5 credits |
| | Design Research Methodologies (HUM 330) | 5 credits |
| | Computers, Ethics, and Social Change (SOC 440) | 5 credits |
| | Natural Science Theory (including a lab) | 10 credits |
| Core (60 credits) | Mobile UI Design (BIT 271) | 5 credits |
| | Android App Development I (BIT 371) | 5 credits |
| | iOS App Development I (BIT 381) | 5 credits |
| | Software Design Patterns & Techniques (BIT 350) | 5 credits |

| Area of Study | Course | Credits |
|---|---|---|
| **Core**<br>(60 credits) | Database Programming (BIT 365) | 5 credits |
| | Android App Development II (BIT 372) | 5 credits |
| | iOS App Development II (BIT 382) | 5 credits |
| | Lifecycle Management (BIT 450) | 5 credits |
| | API Development (BIT 465) | 5 credits |
| | Mobile Backend Services (BIT 470) | 5 credits |
| | Current Trends in Mobile Ecosystem (BIT 480) | 2 credits |
| | Capstone project (BIT 490) | 3 credits |
| | Career Development and Networking (BIT 495) | 2 credits |
| | Internship project (BIT 397/497) | 3 credits |
| | Total | 90 credits |

## Part-Time and Full-Time Student Schedules

Students will have the option of attending the program either on a part-time or on a full-time basis. Students attending full-time could finish the program in 6-8 quarters, which would require two core classes and a general education course each quarter. Students could elect to complete internship requirements over summer.

*Table 4: Full-Time Sample Schedule*

| Full-Time Schedule | Fall | Winter | Spring |
|---|---|---|---|
| **Year 1** | BIT 271 (5 credits)<br>BIT 350 (5 credits)<br>Gen Ed (5 credits) | BIT 371 (5 credits)<br>BIT 381 (5 credits)<br>Gen Ed (5 credits) | BIT 372 (5 credits)<br>BIT 382 (5 credits)<br>Gen Ed (5 credits) |
| **Year 2** | BIT 365 (5 credits)<br>BIT 450 (5 credits)<br>BIT 497 (1 credits)<br>Gen Ed (5 credits) | BIT 465 (5 credits)<br>BIT 470 (5 credits)<br>BIT 480 (2 credits)<br>Gen Ed (5 credits) | BIT 490 (3 credits)<br>BIT 495 (2 credits)<br>BIT 497 (2 credits)<br>Gen Ed (5 credits) |

A part-time schedule would take approximately three years and require a student to follow the core sequence for six consecutive quarters. Students would have the flexibility to take their general education requirements and capstone/internship credits in a subsequent year or the summer quarters.

*Table 5: Part-time Sample Schedule*

| Part-Time Schedule | Fall | Winter | Spring | Summer |
|---|---|---|---|---|
| **Year 1** | BIT 271 (5 credits) BIT 350 (5 credits) | BIT 371 (5 credits) BIT 381 (5 credits) | BIT 372 (5 credits) BIT 382 (5 credits) | Gen Ed (5 credits) |
| **Year 2** | BIT 365 (5 credits) BIT 450 (5 credits) | BIT 465 (5 credits) BIT 470 (5 credits) | BIT 495 (2 credits) Gen Ed (5 credits) | BIT 497 (1 credit) |
| **Year 3** | Gen Ed (5 credits) Gen Ed (5 credits) | Gen Ed (5 credits) BIT 480 (2 credits) BIT 497 (2 credits) | Gen Ed (5 credits) BIT 490 (3 credits) | |

## Certificate Programs Options

In satisfying the junior and senior level coursework, students will also complete three embedded certificate programs. We will also offer these certificates to relevant IT professionals looking to expand their capabilities in mobile platforms. These students would be admitted on a space available basis and required to meet the same program entrance requirements.

*Table 6: Mobile Platform Certificates*

| Certificate | Course | Credits |
|---|---|---|
| **Android Application Development** | Mobile UI Design (BIT 271) | 5 credits |
| | Android App Development I (BIT 371) | 5 credits |
| | Android App Development II (BIT 372) | 5 credits |
| | Capstone project (BIT 490) | 3 credits |
| | Internship project (BIT 397/497) | 2 credits |
| | TOTAL | 20 credits |
| **iOS Application Development** | Mobile UI Design (BIT 271) | 5 credits |
| | iOS App Development I (BIT 381) | 5 credits |
| | iOS App Development II (BIT 382) | 5 credits |
| | Capstone project (BIT 490) | 3 credits |
| | Internship project (BIT 397/497) | 2 credits |
| | TOTAL | 20 credits |
| **Mobile Backend Development** | Database Programming (BIT 365) | 5 credits |
| | API Development (BIT 465) | 5 credits |
| | Mobile Backend Services (BIT 470) | 5 credits |
| | Capstone project (BIT 490) | 3 credits |
| | Internship project (BIT 397/497) | 2 credits |
| | TOTAL | 20 credits |

| CRITERIA | STANDARD |
|---|---|
| Qualified faculty | Provide a profile, including education credentials, of anticipated faculty (full-time, part-time, regular, and continuing) that will support the program for each year (junior and senior). Include faculty needed to cover the technical course work, general education courses and electives. In addition, provide the total faculty FTE allocated to the program. |
| | Faculty and administrators responsible for technical courses must meet certification requirements for professional and technical administrators and instructors in the Washington Administrative Code. |

Current BIT faculty have extensive work experience in the field, meet state certification requirements for professional and technical faculty, attend workshops and have professional development funding for regular trainings to keep current in the field.

*Table 7: Core Faculty Profiles*

| Faculty Name | Degree | Status | FTE Allocation |
|---|---|---|---|
| Brian Bansenauer | Ph.D | BIT full-time faculty | 0.4 |
| Mike Panitz | M.S | BIT full-time faculty | 0.2 |
| Kofi Weusijama | Ph.D | BIT part-time faculty | 0.1 |
| Leslie Doherty | M.Ed | BIT part-time faculty | 0.1 |
| Megan Hazen | Ph.D | BIT part-time faculty | 0.1 |
| New full-time faculty | Masters/Ph.D | To be hired by the start of Year 1 | 1.0 |
| New part-time faculty | Masters/Ph.D | To be hired before the start of Year 2 | 0.2 |

The general education courses will be taught by well-qualified Cascadia faculty who hold advanced, often terminal, degrees in their fields. All faculty have significant experience in interdisciplinary teaching.

*Table 8: General Education Faculty Profiles*

| Faculty Name | Degree | Discipline | Status |
|---|---|---|---|
| Soraya Cardenas | Ph.D. | Sociology | Full-time |
| Chris Gildow | M.F.A. | Art | Full-time |
| Debra Waddell | M.S. | Communications | Full-time |
| Jessica Ketcham-Weber | Ph.D. | English | Full-time |
| Marc Hyman | M.B.A. | Business/Accounting | Full-time |

| Faculty Name | Degree | Discipline | Status |
|---|---|---|---|
| Garth Neufeld | M.A. | Psychology | Full-time |
| Raj Mohandas | M.S. | Engineering | Full-time |
| Midori Sakura | M.S. | Earth and Environmental Sciences | Full-time |
| Sadie Rosenthal | M.S. | Biology | Full-time |
| Nano Tellez | Ph.D. | Mathematics | Full-time |

| CRITERIA | STANDARD |
|---|---|
| Selective admissions process, if used for the program, consistent with an open door institution | Describe the selection and admission process. Explain effort that will be used to assure the program serves as diverse a population as possible. Include specific detail for selecting and students for admittance when there are more applicants than available seats in the program. |

Admissions for this degree program will be handled in a manner similar to the process used in our first applied baccalaureate degree. That is, it will be a collaborative effort between the divisions of Student Success Services and Student Learning and, specifically, will include staff from Enrollment Services, Workforce Education and Faculty.

Cascadia's Communications and Marketing Office will provide high-level marketing support that includes web development and public-facing information. Workforce Education, an office within Student Learning, will provide information sessions as well as individual appointments. These two offices will meet regularly to ensure that efforts are coordinated.

**Program Admission Requirements**

The degree program will use the following admission requirements:

1. An associate's degree (90 credits or more) from a regionally accredited college or university in the area of Computer Science or Information Technology.

2. Minimum 2.5 cumulative G.P.A.

3. Minimum G.P.A. of 2.0 in the following courses:

   - College-level Mathematics
   - College-level English (ENGL&101 or equivalent)
   - College-level Humanities
   - College-level Social Sciences
   - Web or mobile foundations with a design component equivalent to BIT 113
   - Database foundations course equivalent to BIT 275
   - Programming II course equivalent to BIT 143

**Admissions Materials**
   - Cascadia Admission Application and a $30 fee (for students new to Cascadia)
   - BASIT Application Form
   - BASIT Essay
   - Current Resume

- Official Transcripts from all previous colleges

## Competitive Selection

A small team of faculty and staff will evaluate student admissions materials based on the selection rubric in *Table 9: Admission Selection Rubric.* Enrollment staff, including a credentials evaluator, will be utilized to review transcripts. Students selected for the program will be contacted with a letter of acceptance and asked to confirm their participation.

*Table 9: Admission Selection Rubric*

| Application Requirements | Max. Points | Notes |
|---|---|---|
| Cumulative College Level Associate Degree GPA | 40 | Multiply cumulative GPA by 10 to determine total points |
| Average GPA for highest grade in the following core required classes – College level Math, English, Database, and Programming | 20 | Multiply average GPA by 5 to determine total points |
| Resume | 30 | Based on evaluation rubric |
| Essay | 10 | Based on evaluation rubric |
| TOTAL | 100 | |

| CRITERIA | STANDARD |
|---|---|
| Appropriate student services plan | Describe services that will be needed by the students admitted to the degree program and college plan for providing those services for baccalaureate level students. Include a description of financial aid services and academic advising for student admitted into the program. |

Cascadia's strategy for increasing services in relation to a growing student population includes an annual campus wide budget process in which a Budget Council reviews requests for additional staffing to address needs. Cascadia offers a comprehensive student services program to help support students personally and academically as they navigate our institution. Student Success Services works very closely with the Student Learning leadership and both areas report to the same Vice President. This successful collaborative approach will be continued for students enrolled in the Application Development – Mobile Platforms program.

**Assessment**
Cascadia embraces multiple measures when determining appropriate placement for new students. The college utilizes ACCUPLACER as the principal assessment measure for new, adult students that have been out of high school more than two years. Scores are evaluated and students are placed according to the college's stated placement standards. Assessment is waived for students who submit transcripts showing successful completion (2.0 or above) of college-level English or Math. High school students may take the ACCUPLACER or use their Smarter Balanced Assessment (SBA) results for placement. Students who've graduated high school within two years may also be placed using their high school transcript in relation to our high school transcript placement tool. As a Washington Community College we also accept placement assessments taken at other community colleges as part a statewide reciprocity agreement. Math assessments are only valid when completed within 24 months before registering for classes.

**Advising**
When Cascadia launched its first applied bachelor's degree in Sustainable Practices, a new position was created to support students in that degree. This new position functions as a one-stop support person who works with sustainability students from their initial interest in the program through to their completion of the program. This person advises students on their classes, triages student issues, and works with the faculty and Dean to strengthen external partnerships and the Technical Advisory Committee (TAC). Due to the success of that position, Cascadia recently created a "Navigator" position that supports students in our two-year IT programs with advising,

internship preparation and program completion efforts. The Navigator will continue that relationship with existing students and new students entering the bachelor's degree. The IT Navigator will answer general inquiries, meet with prospective students and provide detailed tracking and follow-up with potential students. By emphasizing a single point of contact for this pathway, we hope to ensure student progress from entry to completion.

## Counseling

Counseling services are available to any student who is struggling with issues including family conflict, divorce, substance abuse, depression, grief, loss, and anxiety about academic achievement. Counseling is confidential, professional and free. Cascadia offers counseling services to students through a partnership with the University of Washington – Bothell. Cascadia College students who are enrolled for the current quarter in session may receive up to 6 free counseling sessions of individual counseling. Cascadia College students are also eligible to participate in Counseling Center groups which lasts 4-10 weeks.

## CARE Team

Cascadia's Consultation, Assessment, Response, Education (CARE) Team is comprised of staff from student success services, student learning, campus safety and faculty. The team connects students with college and community resources, provides consultation and support to faculty, staff and administrators in assisting students who display concerning or disruptive behavior and monitors the ongoing behavior of students who have displayed concerning or disruptive behavior. Like many colleges, Cascadia recently developed a Bias Response Team that will function as part of the CARE Team. The intent is to create a more inclusive campus culture by encouraging students to report incidents or speech that is offensive or hurtful to minority groups.

## The Center for Culture, Inclusion and Community

The faculty developing this program have expressed a strong interest in promoting it to women and diverse student populations interested in technology. The Center functions as Cascadia's diversity office and partners with faculty, staff and students on a variety of events and support services. We plan to work with the Center in addition to our Communications and Marketing office as we develop our outreach plans for this degree.

## Disability Support Services

The Office of Disability Support Services (DSS) ensures compliance with the rules and regulations set forth by various congressional acts, i.e., the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) 1990. The primary goal of the office is to ensure access for students with documented disabilities and to contribute to the development of self-advocacy and confidence of students with disabilities. Cascadia provides reasonable and appropriate academic accommodations to enrolled students who have a documented permanent or temporary physical, emotional or sensory disability. Cascadia's Information Services department has been approved to hire an

Accessible Technology Coordinator. We view this new position as a resource that can help integrate information about Accessible Technology into the program.

## Financial Aid

The Student Financial Services office is committed to providing a comprehensive financial aid program for students in the Application Development – Mobile Platforms program that have need and meet other requisite conditions to be eligible for financial aid. Cascadia will offer aid, including loans, work study, grants and scholarships to meet educational expenses. Federal, state and local funds will be sought to provide scholarship support for Application Development – Mobile Platforms students. Once the degree is approved, it will be submitted to the Department of Education for approval for the use of federal aid, including veterans' benefits. Due to a recent change in state policy, another source of aid includes Cascadia's Worker Retraining Program, which is now able to fund students in applied baccalaureate degrees that meet the criteria for dislocated workers.

## Veterans Services

Cascadia is recognized as a "top-ten" veterans-friendly campus by Victoria Media and has specific support services including a Veterans Resource Center, individualized academic advising and financial supports services, counseling services, and other specialized veterans' services. Veterans interested in the Application Development – Mobile Platforms program will be able to access their Veterans Educational Benefits to assist with the completion of this program on campus.

## Academic Support

The Math and Writing Center provides individual and group tutoring in math and writing course concepts, along with workshops and study sessions. The center also employs a BIT tutor specific to our two year program. The center is open mornings, afternoons and evenings to accommodate a variety of student schedules and needs. Cascadia also belongs to the Western E-Tutoring Consortium that provides additional online tutoring service to students in a variety of subjects. As students progress through the BASIT program, we anticipate the creation of an upper level BIT tutor but in the initial years of the program, we will rely primarily on the faculty.

## Support for Technology

The Open Learning Center (OLC) provides technology assistance to support class assignments and offers an extensive list of technology-related services including a large computer lab; Macintosh based video editing stations and equipment check-out (laptops, calculators and audio-video equipment). Trained assistants and staff members are available to help individual students or small groups of students with a wide range of computer applications – including web technology and programming applications.

**Student Programs**

All students enrolled in at least one credit are members of the Associated Students of Cascadia College. As such, students enrolled in the BASSP program will be eligible to participate in all student activities that are provided at Cascadia. This includes, but is not limited to: Cascadia Student Government positions, Cascadia Activities Board positions, student clubs and organizations, campus events and co-curricular programs. Students enrolled in the Application Development – Mobile Platforms program would be able to start a student club related to their area of study or perhaps join the existing NEXT GEN IT club. In 2016, University of Washington – Bothell (UWB) and Cascadia College opened the Activities and Recreation Center (ARC). This amazing facility has become a focal point for student programming and activities while also providing students access to a high quality fitness center on campus.

**Internship Support**

The existing IT Navigator position, mentioned previously, will also support bachelor degree students with their internships. However, we also envision a part-time position that will support the bachelor's program through the development of community projects and internship opportunities. This individual will a detailed understanding of industry and nurture existing relationships with employers in the IT sector while also developing new ones. The goal of this position will be the development of high quality applied learning experiences so that students will have the opportunity to demonstrate their learning and have examples of project work that showcases their skills and abilities.

**Employment and Career Development**

Cascadia students are currently supported in finding a job or refining their career choices in the Technology field. Cascadia offers free and low-cost career services to Cascadia students and the local community, including career events and help with resumes, cover letters, interviewing, and career assessment. Assistance can be found in the Career and Transfer Center.

| CRITERIA | STANDARD |
|---|---|
| Commitment to build and sustain a high quality program | Provide a financial plan for the first five years of program operation.  This plan should include (1) types of funds to be used to support the program; (2) projected program expenses; (3) appropriate facilities to be (4) equipment, technology, and instructional resources needed for the program; and (4) anticipated revenue.<br><br>Document the college's ability to sustain the program over time. |

Cascadia College has committed to fund the costs associated with program launch through college local funds.  The source of the College's support comes from a program development reserve fund.  Recent enrollment growth and prudent fiscal planning has resulted in the accumulation of funds sufficient to begin and sustain the Application Development – Mobile Platforms program for several years until it becomes self-sustaining.

The plan is conservative, reflecting income and expenses for an initial cohort of 15 FTE students followed by enrollment of 35 in year two and 40 in year three.  Our existing applied baccalaureate has a retention rate of approximately 95%.

*Table 10: Enrollment and Financial Data*

| BASIT Application Development – Enrollment and Financial Plan | | | | | | |
|---|---|---|---|---|---|---|
| | 2016-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
| Enrollment | | 15 | 35 | 40 | 42 | 46 |
| Tuition/FTE* | | 6101 | 6101 | 6101 | 6101 | 6101 |
| Sections taught by Associate Faculty | | 3 | 6 | 6 | 6 | 6 |
| | | | | | | |
| | | | | | | |
| Annual Revenue | | 91,515 | 213,535 | 244,040 | 256,242 | 280,646 |
| | | | | | | |
| Program Expenses | | | | | | |
| Staff Salary** | 0 | 24,500 | 24,500 | 24,500 | 24,500 | 24,500 |
| Staff Benefits (30%) | 0 | 7,350 | 7,350 | 7,350 | 7,350 | 7,350 |
| FT Faculty Salary+ | 0 | 56,000 | 57,120 | 58,262 | 59,428 | 60,616 |
| Associate Faculty Salary | 0 | 11,294 | 22,589 | 22,589 | 22,589 | 22,589 |
| Faculty Benefits (35%) | 0 | 23,553 | 27,898 | 28,298 | 28,706 | 29,122 |
| Curriculum Dev. ++ | 17,200 | 4,400 | 2,000 | 0 | 0 | 0 |
| Marketing and Outreach | 10,000 | 10,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| Travel | 1,500 | 2,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Goods and Services | 1,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Professional Development | 1,000 | 1,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| Library Resources | 7,000 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| Library Hourly | 0 | 5,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| Equipment/Software | 5,000 | 5,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| **Annual Expense** | (42,700) | 157,097 | 168,457 | 167,999 | 169,573 | 171,177 |
| **Annual Net Rev-Exp** | (42,700) | (65,582) | 45,708 | 76,041 | 86,699 | 109,469 |
| **Cum. Revenue (Loss)** | (42,700) | (108,282) | (63,024) | 13,017 | 99,686 | 209,155 |

\*Tuition:  Estimated using the SBCTC tuition calculator for BAS credits, assuming a mix of upper and some lower division courses.

\*\*Staff Position:  Assumes 50% of an advisor position that will complement the existing IT Navigator position.  This staff position will focus on building local industry connections for the development of community service and internship projects.

+FT Faculty Position:  This position would start in 2018 and be responsible for coursework in both the associate and bachelor degree programs.

++Curriculum Development:  Includes funding for thirteen course developments at $1200 per course. There is an additional $8,000 spread over the first three years for curricular adjustments as needed.

## Appropriate facilities

Cascadia currently has six computer PC labs plus one Apple lab all with modern computers.  We anticipate need for an additional two classrooms per quarter when the program begins. The first year core classes will be taught in-person meeting twice weekly.  The second year of the program all courses will either be taught online or as a hybrid.  This will increase the classroom need to an average of three per quarter. Currently, there is additional capacity in the 3:30 pm and 5:45 pm timeslots.  To address the lack of storage on campus, we anticipate purchasing locking cabinets for two of the labs to store program specific equipment.

## Equipment, technology and instructional resources needed for the program

Cascadia is fortunate to share library resources with the University of Washington – an R1 institution with extensive electronic resources.  Resources are budgeted for additional library materials each year ($7,000 during startup, $5,000 in subsequent years).  Library staff are experienced in providing high level support for faculty and students in bachelors and graduate programs; additional hours of library support are included.  The college does not anticipate significant new expenses regarding equipment for the program however, our five year plan includes $18,000 for hardware/software expenses.

## Commitment to build and sustain a high quality program

The development of the Application Development – Mobile Platforms degree at Cascadia is widely supported on campus. Dr. Bansenauer presented the degree to Faculty Assembly in May of 2016. The faculty are enthusiastic about launching a second high-quality baccalaureate program on campus. The Board of Trustees approved the

development of the degree at their meeting in June of 2016. The degree is a priority of our President as well.

Once program approval is received, an on-going task force will be formed comprised of faculty, the Dean for Student Learning, Student Success representatives and the VP for Student Learning and Success; this group will meet regularly to develop curriculum and policies, consider admissions and discuss recruiting and job placement.

| CRITERIA | STANDARD |
|---|---|
| Program specific accreditation | Indicate whether the institution will seek specialized program accreditation. If so, describe plans for accreditation and identify appropriate accreditation body. Include a statement of college's plan to seek accreditation through NWCCU and/or current status of college's standing to offer applied baccalaureate degrees. |

There is no program specific accreditation required for the BASIT: Application Development – Mobile Platforms.

Cascadia College has already received accreditation from the Northwest Commission on Colleges and Universities (NWCCU) as a four-year degree granting institution in a letter dated October 16, 2016.

Once Cascadia has received SBCTC approval for this degree, the college will apply for an NWCCU review of program via through the accreditor's process for substantive change.

| CRITERIA | STANDARD |
|---|---|
| Pathway options beyond baccalaureate degree. | Describe opportunities and articulation agreements for the place bound BAS graduate to continue their education onto a graduate (Master's) degree program. Detail specific discussions with public and private baccalaureate institutions (when applicable) regarding post-baccalaureate pathways for graduates. |

While the emphasis of this new degree program is to prepare graduates for employment opportunities within industry, we recognize that some students may want to pursue graduate level education as well.

Cascadia has initiated conversations with public and private institutions about developing pathways from the BASIT Application Development – Mobile Platforms program to several Master's level programs.

One pathway is Central Washington University's Master's degree program in Information Technology and Administrative Management (ITAM).  Suzette Johnston at CWU confirmed their program is open to students with applied Bachelor of Science degrees similar to this degree.  Graduates of our program would be eligible to apply once they've earned their degree and Central has offered to collaborate with us further once the program is underway.

Place-bound students would be eligible to enroll at Western Governors University in the MBA program that emphasizes Information Technology Management. City University also offers an MBA with a Technology Management emphasis that would be an appropriate destination for graduates.

Additionally, graduates may choose from a variety of Graduate Certificate Programs including Seattle University's Graduate Certificate in Computer Science Fundamentals and UW Bothell's Graduate Certificate in Software Design and Development. Graduates can complete the certificate in about a year while working fulltime and then continue with a traditional MS degree in Computer Science.

| CRITERIA | STANDARD |
|---|---|
| External expert evaluation of program | The institution will select two external experts to review the program. External experts should come from a university level institution, i.e. departmental professor, academic dean or department head. The expert should be a practitioner/instructor from within the content area of the proposal. |
| | In a separate document, provide copies of external evaluators' report or letters. Summarize the institution's responses and subsequent modification to the proposal based on evaluator's recommendations. Attach a short bio of the evaluators. |

Two external computer science experts reviewed the proposed program using the BAS External Reviewer rubric. Their evaluation reports are included in Appendix B and Appendix C.

**Response to External Reviews**
Reviewers' overall impression of the program was extremely positive. They expressed regard for the quality and rigor of the program, the college's support, and the employability of graduates in the Seattle and surrounding area. The reviewers also provided several ideas and suggestions to strengthen the program further. In particular, we note the following improvements in response to these suggestions.

- We have added suggested pathway options for UW Bothell's Graduate Certificate in Software Design and Development and the Seattle University's Graduate Certificate in Computer Science Fundamentals
- We have included an advising notation regarding the Calculus I requirement for students wishing to work toward a Masters in Computer Science at UW Bothell.
- We have identified three industry-ready certificates in response to comments that, "The upper level courses are very close to the industry. Students will be able to gain resume-worthy experience through capstone and internship program, which is very valuable."
- We added BIT 265 – Structures and Algorithms as the recommended elective course in response to feedback regarding the importance of this class' core concepts, knowledge of which is often used as a determining factor in entry-level hiring decisions.
- We have updated the degree outcomes with language emphasizing graduates' ability to continue to investigate and learn new technology.

- We updated the course description for the Software Design Patterns course to include explicit mention of essential architectures like MVC and MVVM.
- We updated course descriptions of the second-level application development classes (BIT 372 and BIT 382) to include additional emphasis on communication infrastructure and platform-specific design architectures.
- We have clarified the intention to hire a full-time faculty member by the beginning of the program to help finalize development, work with industry partners, and prepare to teach courses.
- We also clarified that the two review processes in the program assessment have different goals; the annual review will attend to student progression, and the biennial review will focus on overall curricular match to industry expectations.

## Short Biography of External Reviewers

**Kelvin Sung, Ph.D, Professor**
Computing and Software Systems
University of Washington, Bothell
18115 Campus Way NE
Bothell, WA 98011-8246
Phone: (425)-352-5420□
Email: ksung@uw.edu

Dr. Sung is a Professor with the Computing and Software Systems at University of Washington Bothell (UWB). He received his Ph.D. in Computer Science from the University of Illinois at Urbana-Champaign in 1992. His background is in computer graphics, hardware and machine architecture. He came to UWB from Alias|Wavefront (now part of Autodesk) in Toronto where he played a key role in designing and implementing the Maya Renderer, an Academy Award winning image generation system. Before joining Alias|Wavefront, Kelvin was an Assistant Professor with the School of Computing, National University of Singapore. Kelvin's research interests are in studying the role of technology in supporting human communication. Funded by Microsoft Research and the National Science Foundation, Kelvin's recent work focuses on the intersection of videogame mechanics, real-world problems, and mobile technologies. Results from these activities include a series of videogames on campus orientation, KinectMath: a Microsoft Kinect-based Algebra teaching system, publications in the Communications of the ACM, IEEE Computers, IEEE Transactions Journals, a published textbook on Computer Graphics, and three books on approaches to building 2D game engines. Kelvin teaches both undergraduate and graduate classes in Computer Graphics, Video Game and Game Engine Development, and Mobile Computing.

**Sullivan Liu, Senior Software Engineer**
Uber Technologies, Inc.
1191 2nd Ave, 1400
Seattle WA 98101
Phone: 4256330886
Uber email: zl@uber.com
Personal email: zelinliu@me.com

Sullivan Zelin Liu is currently a Senior Software Engineer at Uber Technologies Inc. At Uber, he built and owned multiple mobile products. He is the founding member of the Scheduled Rides team. He has designed and architected Scheduled Rides' mobile products across platforms, built a highly reliable mobile product that currently operates in 300+ cities worldwide. Before Uber, Sullivan founded and worked at multiple startups after graduating from the University of Washington with a Bachelor of Science in Applied Computational Math Science - Discrete Math and Algorithms.

## Appendix A: Course Descriptions

*Mobile UI Design (BIT 271)*    *5 credits*

Students design several mobile applications for Android and iOS from concept to final testing. Using multiple tools and platform UI guidelines, students learn rapid prototyping and user testing techniques to create beautiful and functional user interfaces. Emphasis is placed on usability, aesthetics and the mobile development process.

*Design Research Methodologies (HUM 330)*    *5 credits*

Design problems are human problems and to design towards an elegant solution is to engage in an iterative process rooted in empathy. In this course, students will gain a deeper understanding of the roles of research, storytelling, and problem solving in design processes. Students will practice defining problems, determining research questions, identifying appropriate design research methodologies, crafting user profiles and narratives, synthesizing research findings, and producing visuals that communicate design insights and solutions. Theories and processes covered include: design thinking; visual rhetoric (including color and typography); actor-network theory; semiotics; user/audience analysis; aesthetics and ethics in document design; qualitative and quantitative design research methodologies; and data (including textual, visual, and numeric) synthesis and analysis.

*Software Design Patterns and Techniques (BIT 350)*   *5 credits*

Students will learn essential software design principles and patterns related to mobile development and put them into practice. These include the S.O.L.I.D. principles of the Object Oriented Programming paradigm, Representational state transfer (REST) and RESTful web services, multi-threading and networking techniques, and the decorator, delegate, Model-View-Controller, Model-View-View-Model and other design patterns.

*Database Programming (BIT 365)*    *5 credits*

In this course students will focus on using a relational database and SQL for managing persistent data. Students will learn various techniques for designing high-performance data access including supplementing persistent data stores with a NoSQL caching layer for heavily used services. There will also be an introduction to some of the major options for persistent NoSQL solutions.

*Android App Development I (BIT 371)*    *5 credits*

Students develop a custom Android app as part of a development team working with Android Studio. Following agile development practice, students create app features utilizing key components of the Android SDK. Unit testing and compatibility across OS versions and device sizes are emphasized; Play Store distribution is also explored.

### Appendix A: Course Descriptions

*iOS App Development I (BIT 381)5 credits*

Students will be introduced to building iOS applications with Swift as part of an agile development team.  Using XCode to develop, debug and test, students will build an application that leverages some of the major components of the iOS SDK.  Students will use Interface Builder as a tool for quickly prototyping UI elements and learn techniques for handling various screen sizes.  Students will also be introduced to automated testing with UI Automation.

*Android App Development II (BIT 372)  5 credits*

Students will continue building Android apps and explore more advanced topics such as techniques for asynchronous web service requests, working with local data, handling notifications, communication infrastructure, and platform specific design architectures. Students perform automated UI testing and managed user testing via alpha and beta releases.

*iOS App Development II (BIT 382)        5 credits*

Students will continue building iOS apps with Swift, learning more advanced topics such as techniques for asynchronous web service requests, working with Core Data, handling notifications, communication infrastructure, and using platform specific design architectures.  Testing will also be covered with an introduction to writing unit tests for code coverage, as well as packaging and distribution via the App Store.

*Computers, Ethics, and Social Change (SOC 440)        5 credits*

This class addresses how society has and continues to change with the introduction of computers and technology. Along with outlining the changes, the class will address issues of ethics, social responsibility, privacy, legalities and security issues that come with rapidly changing technologies. Examples of topics include (but not limited to): Calling Bullshit (UW course title), Social Inequalities and Coding, Politics (Hacking, Bots & Psychometrics) and Privacy Issues.

*Lifecycle Management (BIT 450)        5 credits*

Students work within a development team using processes needed to manage the software development lifecycle, from concept to completion: planning, development, testing, deployment, maintenance, bug tracking, and user analytics. Students investigate tools for task management, scheduling, resource management, reporting and analytics.

*API Development (BIT 465)        5 credits*

Most modern mobile applications communicate with a server, whether it's sending game scores, posting updates, downloading videos, or receiving notifications.  Students will build a backend system creating REST endpoints for creating, reading, updating and

### *Appendix A: Course Descriptions*

deleting data with their apps. The students will learn what an ORM is and how it can be leveraged to build and interact with database systems.

*Mobile Backend Services (BIT 470)*      *5 credits*

This course introduces Backend-as-a-Service frameworks for working with identities and data across multiple devices, platforms, and applications. Students explore several options including Function-as-a-Service (FaaS), Platform-as-a-Service (PaaS) and containers. The benefits, limitations and key distinctions of different architectures are considered as well as issues of offline synchronization and compliance with industry-specific and regional regulations (HIPAA, PCI-DSS, or FIPS). Students will also learn development methodologies suitable for deploying apps on modern cloud platforms.

*Current Trends in Mobile Ecosystem (BIT 480)*      *2 credits*

This course explores current and emerging tools and trends in mobile application development. Students will research and report on topics of particular interest. Sample topics include collaborative app development (DevOps), Android instant apps, location-based services, integration of augmented reality and Internet of Things.

*Capstone project (BIT 490)*      *3 credits*

Students identify a specific, authentic direction for research and implementation of some aspect of mobile development for their portfolio. Students define and implement their project, evaluate the outcomes, and present their results to appropriate internal or external audiences. Students will also reflect on their capabilities across program outcomes and develop a plan for addressing areas of needed growth to prepare for a career in mobile development.

*Career Development and Networking (BIT 495)*      *2 credits*

Students develop their portfolio with professional networking connections and course, internship or professional projects. Students also prepare for technical interviews, and develop their job search materials and a mentor connection.

*Internship project (BIT 397/497)*      *3 credits*

Students engage in hands-on experiences through a sustained relationship with a work setting in the field of mobile development. Students may continue work with a mentor to consider how key mobile platform technologies and program outcomes interact in a work setting. They also reflect on their own capabilities and develop a plan for addressing areas of needed growth to prepare for a career in the field.

## Appendix B
Applied Baccalaureate External Review Rubric

*Bachelor of Applied Science I.T. – Application Development*

*Mobile Platforms*

*Cascadia College*

*Instructions for External Expert Reviewers:*

1. External Expert Reviews provide critical feedback to colleges so that they may address potential concerns, issues or criticisms prior to final submission of a program proposal to the State Board of Community and Technical Colleges.
2. Reviewers should be independent, third-party persons or teams with subject/discipline expertise.
3. The goal of a review is to assess the credibility, design, relevance, rigor, and effectiveness of the proposed BAS program.
4. Reviewers should also validate the congruency and consistency of the program's curriculum with current research, academic thinking and industry standards.
5. Reviewers need not provide responses to every criteria listed in the Rubric. If reviewers feel that they cannot adequately address any one of the criteria, they may simply state that this is the case.
6. This form is designed to assist External Expert Reviewers to complete assessments of baccalaureate degree program proposals. External Expert Reviewers are not restricted to the use of this rubric template. Reviewers may choose, instead, to provide a college with a written narrative. In whatever format they choose, reviewers should address the criteria outline in the rubric.

# Applied Baccalaureate External Review Rubric

| College Name: | Cascadia College | BAS Degree Title: | BAS IT in Application Development *Mobile Platforms* |
|---|---|---|---|
| Reviewer Name/ Team Name: | Kelvin Sung | Institutional or Professional Affiliation: | University of Washington Bothell |
| Professional License or Qualification, if any: | Professor, PhD Computing and Software Systems School of STEM | Relationship to Program, if any: | None. |

| Please evaluate the following Specific Elements | | | |
|---|---|---|---|

| a) Concept and overview | Is the overall concept of the degree program relevant and appropriate to current employer demands as well as to accepted academic standards?   Will the program lead to job placement? |
|---|---|
| | **Comment** <br> Mobile application development consists of knowledge in areas including: <br> 1. front end user interface: how to compose the application <br> 2. backend system support: business logic exists on servers <br> 3. software engineering in design and development process <br> 4. end-users issues: privacy, ethics, financial model, etc. <br> 5. communication infrastructure: WiFi, data, near field, blue tooth, etc. <br> The proposed curriculum include classes that cover the first 4 areas explicitly. The described classes are based on practical, industry-wide, and contemporary technologies.  The last area, though no explicitly listed as a separate course, can be integrated into existing more advanced courses (e.g., BIT372: Android App Development II, or BIT382: iOS App Development II). <br><br> Android and iOS are by far the dominant technologies in the mobile space, together with the rigor of the proposed curriculum in covering the building of applications for these platforms; successful graduates from this degree program are likely to be sought after by the relevant employers. |
| b) Degree Learning Outcomes | Do the degree learning outcomes demonstrate appropriate baccalaureate degree rigor? |
| | **Comment** <br> The proposed curriculum includes requirements of broad based general education area (humanities, social and natural sciences, quantitative reasoning, communication skills), and, in depth technical areas that demand hands- |

BASIT – Cascadia College

# Applied Baccalaureate External Review Rubric

| | | |
|---|---|---|
| | | on experimentation from students. It represents a strong, and well-rounded employment focused baccalaureate degree program. |
| c) | Curriculum Alignment | Does the curriculum align with the program's Statement of Needs Document? |
| | | **Comment**<br>The proposed curriculum is targeted at training developers with skills in building Android and iOS applications. The program's Statement of Needs Document pointed out the needs for Mobile Application Developer in the Seattle and surrounding areas, the wish of students in pursuing baccalaureate degrees in high-technology areas, and the shortage of such degrees in the existing public higher education systems.<br><br>The proposed MoBAS is well-aligned with the program's Statement of Needs Document. |
| d) | Academic Relevance and Rigor | Do the core and elective courses align with employer needs and demands?   Are the upper level courses, in particular, relevant to industry?  Do the upper level courses demonstrate standard academic rigor for baccalaureate degrees? |
| | | **Comment**<br>The proposed curriculum requires students to take *all of the courses* described. In this way, there is no *elective courses* involved. The 60-credits of course classes represent a healthy combination of technology/platform specific and technology agnostic classes. While BIT272/372/282/382, the core group of front end hands-on development classes, are based on specific technologies (Android and iOS); the rest of the classes are agnostic to any existing technologies. With this combination, graduates will be able to meet employers' needs on the most important front: the apps for the end user; while they gradually extend their impacts to the less visible backend and software processes. |
| | | Are the general educations requirements suitable for a baccalaureate level program?  Do the general education courses meet breadth and depth requirements? |
| e) | General Education Requirements | **Comment**<br>The general education requirements cover the important areas including humanities, social and natural sciences, communication skills, and quantitative reasoning. The curriculum design allows students to build depths in an area (by taking multiple classes in an area, and/or using free elective credits). |
| f) | Preparation for Graduate | Do the degree concept, learning outcomes and curriculum prepare graduates to enter and undertake suitable graduate degree programs? |
| | | **Comment** |

BASIT – Cascadia College

## Applied Baccalaureate External Review Rubric

| | | |
|---|---|---|
| | Program Acceptance | It appears that there are two general pathways for graduates from this degree program to pursue graduate degrees. 1) Management pathway: with appropriate on-the-job experience, it would be straightforward for graduates to pursue MBAs. 2) Technical pathway: graduates can choose from a varieties of Graduate Certificate Programs, E.g., UW Bothell's Graduate Certificate in Software Design and Development*; or the Seattle University's Graduate Certificate in Computer Science Fundamentals, complete the certificate while working fulltime (in about a year) and continue with a traditional MS degree in Computer Science.<br><br>\* Students will need Calculus-I |
| g) | Faculty | Do program faculty qualifications appear adequate to teach and continuously improve the curriculum? |
| | | **Comment**<br>While the existing faculty is strong and is excellent for launching the proposed curriculum, for the program to be successful and flourish, it is vital that the proposed hire positions be fulfilled in a timely manner. |
| h) | Resources | Does the college demonstrate adequate resources to sustain and advance the program, including those necessary to support student and library services as well as facilities? |
| | | **Comment**<br>The Cascadia College supports students with comprehensive and well-rounded services ensuring their success, including academic advising, academic tutoring, wellness counseling, disability support, financial aid, veterans' services, technology support, student life, and job placements. For library services, Cascadia College has the wonderful sharing model with University of Washing Bothell and the proposed budget includes reasonable support for library. |
| i) | Membership and Advisory Committee | Has the program received approval from an Advisory Committee? Has the program responded appropriately to it Advisory Committee's recommendations? |
| | | **Comment**<br>It appears that the Technical Advisory Committee (TAC) has not been established at this point. The proposal described plans for extending, by four members, the college's TAC for their existing Web Application degree. |
| j) | Overall assessment and recommendations | Please summarize your overall assessment of the program. |
| | | **Comment**<br>The proposed curriculum is timely with rigors in covering important general education areas, and core technical classes that are based on both technology specific skills and general concepts; and in the increasingly important area of mobile application development where there is currently a shortage in workers. |

BASIT – Cascadia College

|  | After the initial launched, faculty in the program may consider refining the curriculum to allow technical elective options for students to pursue in-depth knowledge, e.g., mobile gaming, medical specific applications, support for internet of things, considerations for infrastructural issues (network, sensors) etc. Another area of consideration for future refinement may be the potentials of consolidating the platform specific courses and increasing the coverage of technology agnostic concepts. |
|---|---|

**Reviewer Bio or Resume**

Evaluator, please insert a short bio here

**Bio:** Kelvin Sung is a Professor with the Computing and Software Systems at University of Washington Bothell (UWB). He received his Ph.D. in Computer Science from the University of Illinois at Urbana-Champaign in 1992. His background is in computer graphics, hardware and machine architecture. He came to UWB from Alias|Wavefront (now part of Autodesk) in Toronto where he played a key role in designing and implementing the Maya Renderer, an Academy Award winning image generation system. Before joining Alias|Wavefront, Kelvin was an Assistant Professor with the School of Computing, National University of Singapore. Kelvin's research interests are in studying the role of technology in supporting human communication. Funded by Microsoft Research and the National Science Foundation, Kelvin's recent work focuses on the intersection of videogame mechanics, real-world problems, and mobile technologies. Results from these activities include a series of videogames on campus orientation, KinectMath: a Microsoft Kinect-based Algebra teaching system, publications in the Communications of the ACM, IEEE Computers, IEEE Transactions Journals, a published textbook on Computer Graphics, and three books on approaches to building 2D game engines. Kelvin teaches both undergraduate and graduate classes in Computer Graphics, Video Game and Game Engine Development, and Mobile Computing.

**Resume:**

# Kelvin Sung

**Professor**
**Computing and Software System**
**University of Washington, Bothell**
**Phone: (425)-352-5420**
**Email: ksung@uw.edu**

**Research Interests**    Applied Pedagogy; Videogame Development; Location Aware Applications; Computer Graphics; All aspects of image generation; Visualization; Augmented/Virtual/Mixed Reality.

# Applied Baccalaureate External Review Rubric

| | |
|---|---|
| **Teaching Interests** | Computer Graphics; Videogames Games Development; Mobile Computing; Operating Systems; Digital Logic; Undergraduate introductory courses. |
| **Education** | PhD in Computer Science, University of Illinois at Urbana-Champaign  (1992)<br>MS in Computer Science, University of Illinois at Urbana-Champaign (1990)<br>BS in Electrical Engineering, University of Wisconsin at Madison (1986) |

**Experience**

| | |
|---|---|
| 2012–13, 15–now | **Associate Director for Graduate Studies** |
| | **Undergraduate  Education Coordinator** |
| 2013–14 | **Professor with Tenure** |
| | **Associate Professor with Tenure** |
| 2009 – now | Computing and Software Systems |
| | University of Washington, Bothell |
| 1999 – 2009 | |
| 2016 – 2019 | **External Examiner**<br>Faculty of Computing and Informatics (FCI)<br>Multimedia University, Cyberjaya, Selangor, Malaysia |
| | **Visiting Professor**<br>UTM-IRDA Digital Media Center |
| Fall 2014 | Universiti Teknologi Malaysia (University of Technology, Malaysia) |
| *One-week visit* | **Software Architect**<br>**Senior Software Engineer**<br>Alias\|Wavefront, Toronto, Canada |
| | • One of the chief designers of the Maya Renderer. Alias\|Wavefront was awarded the *Academy Award for Scientific and Technical Achievement* in 2002 for the |
| 1998 – 1999 | development of the Maya image generation system.<br>• Co-Developed a patented motion blur algorithm. |
| 1995 – 1998 | |
| 1992-1995 | **Lecturer (Assistant Professor)**<br>Department of Information Systems and Computer Science<br>National University of Singapore |

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| | **Visiting Researcher** |
| Summer 1993 | Institute of Information Science |
| | Academia Sinica, Taiwan |

| | **Research Assistant** |
| 1987-1992 | Department of Computer Science |
| | University of Illinois at Urbana-Champaign |

| | **Teaching Assistant** |
| 1986-1987 | Department of Information Systems and Computer Science |
| | National University of Singapore |

## Recent Grants

- "Expanding Interactive College Affordability Prototype Model," *Lumina Foundation for Education*, Award Number: 9539, $327,300, 2015-2017. PI: Jim Fridley (University of Washington), co-PI: **K. Sung**.
- "Pilot of *Reality Ends Here* Game from USC," *Microsoft Research Connection* and *Microsoft Partners in Learning*, $47,000, 2013. PI: J. Pace (Digital Future Lab, UWB), co-PI: **K. Sung**.
- "Game-Themed CS1/2: Empowering the Faculty," *TUES Type-1, NSF*, DUE-1140410, $229,986, 2012-2015, PI: **K. Sung**, co-PI: M. Panitz (Cascadia Community College), J. Pace (Digital Future Lab, UWB).
- "Curriculum for Windows Phone 7 Gaming Platform," *Microsoft University Relations* and *Microsoft Studios*, $15,000, 2011-2012, PI: **K. Sung**.
- "Advanced Placement Computer Science Principles Pilot Course," *Microsoft Research*, $50,000, 2011-2012. PI: **K. Sung**, co-PI: Lawrence Snyder (University of Washington).
- "Kinections in Education," *Microsoft Research* and *Microsoft Partners in Learning*, $166,750, 2011-2012. PI: R. Angotti (UWB), co-PI: **K. Sung**.

## Recent Internal Grants

- "Exploring Multi-Tiered Web-based Visualization System," *Computing and Software Systems Division, University of Washington*, $2,500, October 2015.
- "Infrastructure for Sustainable Outreach," *Computing and Software Systems Division, University of Washington*, $50,000, October 2014.
- "Initial Prototype for Commercialization of Linx and Space Smasher Casual Games," *Center for Commercialization, University of Washington*, $25,000, with Jason Pace, Digital Future Lab, March 2014.
- "Casual Game Engine for Cross Platform Gameplay Support," *Computing & Software Systems Graduate Student Scholarship, University of Washington, Bothell*, $40,650, Scholarship support for Jebediah Pavleas, Sep 2013 – June 2016.
- "Learning and evaluating game-themed library interface," *Undergraduate Research Scholarship, Office of Research, University of Washington, Bothell*, $750, Scholarship support for Abigail Carey and Fernando Arnez, March 2013.

## Recent Hardware Donations

- Microsoft .Net Gadgeteer Development Kits (15x Tinker, 1x Spider Starter), $1,769.59, *Microsoft Research Connection*, 2014.
- Android Phone Development Units (15x), $8250, *HTC Connected Services*, 2013.
- Windows Phone 8 Development Units (5x), $4,000, *Microsoft Mobiles Team*, 2013.
- Windows Phone 7.5 Development Units (10x), $5,000, *Microsoft Windows Phone 7 Team*, 2012.
- Windows Phone 7 Development Units (34x), $17,000, *Microsoft Windows Phone 7 Team*, 2011.

## Selected Recent Books

- M. Tanaya[*], H. Chen[*], J. Pavleas[*], and, **K. Sung**, "Building a 2D Game Physics Engine: Using HTML5 and JavaScript," *APress*, December 2016. ISBM-13: 978-1-4842-2582-0. [*]*Graduate student.*
- **K. Sung**, J. Pavleas[*], F. Arnez[*], and J. Pace, "Build your own 2D Game Engine and Create Great Web Games," *APress*, October 2015. ISBN-13: 978-14842-09530. [*]*Graduate,* [*]*Undergraduate student.*
- J. Pavleas[*], J. Chang[*], **K. Sung**, and R. Zhu, "Learn 2D Game Development with C#," *APress*, December 2013. ISBN-13: 978-14302-66044. [*]*Undergraduate,* [*]*Graduate student.*

## Selected Recent Refereed Publications

1. **K. Sung**, R. Nash, J. Pace, "Building Casual Game SDKs for Teaching CS1/2, A Case Study" to appear in *The Journal of Computing Sciences in Colleges, Vol. 32, No. 1*, (Proceedings of CCSC-NW 2016), Oct 2016.
2. B. Chau[*], R. Nash, **K. Sung**, J. Pace, "Building Casual Games and APIs for Teaching Introductory Programming Concepts, " Short Paper *in FDG 2015*, June 2015. [*]*Graduate students.*
3. **K. Sung** and L. Snyder, "A Case of Computer Science Principles With Traditional Text-Based Programming Languages," *CCSC-NW 2014*, October, 2014.
4. **K. Sung** and A. Samuel, "Mobile Application Development Classes for the Mobile Era," *Proceedings of the 2014 conference on Innovation & technology in computer science education (ITiCSE '14)*, PP. 141-146, June 2014.
5. Jack Keng-Wei Chang[*], Long Hoang Dang[*], Jebediah Pavleas[*], Joseph F. McCarthy, **K. Sung**, and Jason Bay, "Experience with Dream Coders: Developing A 2D Role Playing Game For Teaching Introductory Programming Concepts," *The Journal of Computing Sciences in Colleges, Vol. 28, No. 1*, PP. 227-236, October 2012 (Proceedings of the Fourteenth Annual CCSC-NW Conference). [*]*Undergraduate students.*
6. **K. Sung**, C. Hillyard, R. Angotti, M. Panitz, D. Goldstein, J. Nordlinger, "Game-Themed Programming Assignment Modules: A Pathway for Gradual Integration of Gaming Context into Existing Introductory Programming Courses," *IEEE Transactions on Education, Vol. 54, No. 3*, PP. 416-427, August 2011.
7. H. Asuncion, D. Socha, **K. Sung**, S. Berfield, and W. Gregory, "Serious Game Development As An Interactive User-Centered Agile Software Project," *International Conference on Software Engineering (ICSE) Workshops, First Games and Software Engineering Workshop (GAS 2011)*, May 2011.
8. P. Drake, and **K. Sung**, "Teaching Introductory Programming with Popular Board Games," *Proceedings of the 42nd SIGCSE Technical Symposium on Computer science education* (Dallas, TX, USA), *SIGCSE '11*, PP. 619–624, March 2011.
9. R. Angotti, C. Hillyard, M. Panitz, **K. Sung**, K. Marino, "Game-Themed Instructional Modules: A Video Case Study," *Proceedings of the Fifth International Conference on the Foundations of Digital Games* (Monterey CA, USA) *FDG '10*, PP. 9-16, June 2010.

10. C. Hillyard, R. Angotti, M. Panitz, **K. Sung**, J. Nordlinger, D. Goldstein, "Game-Themed Programming Assignments for Faculty: A Case Study," *Proceedings of the 41st SIGCSE Technical Symposium on Computer Science Education* (Milwaukee, WI, USA) *SIGCSE '10*, PP. 270-274, March 2010.

### Selected Recent Peer Reviewed Tutorials/Workshops/Panels/Posters

1. R. Bryant (Moderator), D. Ely, R Lewis, **K. Sung**, and B. Wilson, "How AP Computer Science Principles and AP Computer Science A fit with our schools," to appear in *The Journal of Computing Sciences in Colleges, Vol. 32, No. 1, Panel*, (Proceedings of CCSC-NW 2016), Oct 2016.

2. **K. Sung**, J. Pace, and R. Nash, "Learn CS1/2 by Playing and Building Commercial Grade Casual Games," *SIGCSE 2016, Workshop*, March, 2016.

3. **K. Sung**, and M. Panitz, "Casual Game as CS1/2 Teaching Modules or Exercises," *The Journal of Computing Sciences in College*, Vol. 29, No. 1, Tutorial offered at the Sixteenth Annual CCSC-NW Regional Conference, October, 2014.

4. V. Larios, and **K. Sung**, "Open Source and Freeware Tools for 3D Game Development Courses," *workshop offered at SIGCSE 2011*, March 2011.

5. M. Panitz, **K. Sung**, J. Nordlinger, "Develop Game-Themed Examples for CS1/2 without background in Graphics or Games," Workshop offered at *ACM SIGCSE'10 Conference*, March 2010.

### Selected Recent Professional Columns/Guest Editorials

- B. Chau[a], A. Robinson[b], J. Pace, R. Nash, and **K. Sung**, "Corrupted: A Game to Teach Programming Concepts," *Entertainment Computing Column, IEEE Computer*, Vol. 47, No. 12, PP. 86-89, December, 2014. [a]*Graduate student,* [b]*Undergraduate student.*

- F. Arnez[a], J. Pace, **K. Sung**, "Learning While building Games for Teaching," *Entertainment Computing Column, IEEE Computer*, Vol. 47, No. 4, PP. 88-91, April, 2014. [a]*Undergraduate student.*

- **K. Sung**, "Culture- and Heritage-Driven Computing R&D in Asia," *Guest Editor's Introduction*, Computing Now, IEEE on-line magazine, http://www.computer.org/portal/web/computingnow/archive/july2012, July, 2012.

- C. Chang, V. Getov, **K. Sung**, "Computing in Asia: A Sampling of Recent Success Stories," *Guest Editors' Introduction, IEEE Computer*, Vol. 45, No. 6, PP. 21-23, June, 2012.

- H. Tsai[a], **K. Sung**, "Mobile Applications and Museum Visitation," *Entertainment Computing Column, IEEE Computer*, Vol. 45, No. 4, PP. 95-98, April, 2012. [a]*Graduate student.*

### Selected Recent Invited Short Course/Workshops/Presentations

- "Exploring AR and VR in the Ultra Reality Sandbox," *The Winter'17 Research In Progress Series, University of Washington Bothell*, Feb 2017.

- "Introduction to 2D Game Engine Development," Invited two-week short course, *National University of Singapore, Suzhou Research Institute*, July 2016.

- "Learnings from Building Videogames for Learning," *Department of Computer Science and Information Engineering, National Dong Hwa University*, Hualien, Taiwan, March 2016.

- "Mobile Application Development," Invited two-week short course, *National University of Singapore, Suzhou Research Institute*, August 2014, 2015.

- "Learnings from Building Videogames for Learning," *SiChuan University*, Chengdu, China, July 2015.

- "Mobile Application Development Programming Marathon," Invited one-week short course, *International Exchange Camp of Computer Institute, Sichuan University*, Chengdu, China, July 2015.

- "Learnings from Building Videogames for Learning," *Department of Computer Science, National Chiao Tung University*, Hsinchu, Taiwan, April 2015.
- R. Nash, **K. Sung**, and J. Pace, "Learn CS1/2 by Playing and Building Commercial Grade Casual Games," NSF Showcase, *SIGCSE 2015*, March 2015.
- "Learnings from Building Videogames for Learning," Invited Keynote Address, *The 3rd International Conference on Interactive Digital Media 2014 (ICIDM 2014)*, Kota Kinabalu, Sabah Malaysia, December 2014.
- **K. Sung**, M. Panitz, and J. Pace, "Game-Themed Introductory Programming for Faculty," NSF Showcase, *SIGCSE 2013*, March 2013.
- "Introduction to Game Programming with XNA and Windows Phone 7," Invited One Week Short Course, *Warsaw School of Computer Science*, Warsaw, Poland, May 2012.
- "Mobile Computing, Smartphones, and Existing Computer Science Classes," *SmartPhones in the Curriculum Workshop (SMACK 2011), 24th IEEE Conference on Software Engineering Education and Training (CSEE&T)*, May 2011.
- "Game-Themed CS Education: Empowering the Faculty," and "Video Game Design Workshop," Invited 2-day visit, *Department of Computer Science, Iowa State University*, Ames, Iowa, November 2010.
- "Video Game Design Workshop," Invited two-day Workshop, *Faculty of Physics, Universidad Autonoma de Nuevo Leon (UANL)*, Monterrey, Mexico, October 2010.
- "Developing Game-Themed Applications With XNA," Invited 3-day workshop, *Serious Games Winter School 2010*, Puerto Vallarta, Mexico, February 12-14, 2010 [*Sponsored by Information Systems Department, University of Guadalajara*].

## Appendix C
## Applied Baccalaureate External Review Rubric

*Bachelor of Applied Science I.T. – Application Development*

*Mobile Platforms*

*Cascadia College*

### Instructions for External Expert Reviewers:

1. External Expert Reviews provide critical feedback to colleges so that they may address potential concerns, issues or criticisms prior to final submission of a program proposal to the State Board of Community and Technical Colleges.
2. Reviewers should be independent, third-party persons or teams with subject/discipline expertise.
3. The goal of a review is to assess the credibility, design, relevance, rigor, and effectiveness of the proposed BAS program.
4. Reviewers should also validate the congruency and consistency of the program's curriculum with current research, academic thinking and industry standards.
5. Reviewers need not provide responses to every criteria listed in the Rubric. If reviewers feel that they cannot adequately address any one of the criteria, they may simply state that this is the case.
6. This form is designed to assist External Expert Reviewers to complete assessments of baccalaureate degree program proposals. External Expert Reviewers are not restricted to the use of this rubric template. Reviewers may choose, instead, to provide a college with a written narrative. In whatever format they choose, reviewers should address the criteria outline in the rubric.

# Applied Baccalaureate External Review Rubric

| College Name: | | BAS Degree Title: | |
|---|---|---|---|
| Reviewer Name/ Team Name: | Sullivan Zelin Liu | Institutional or Professional Affiliation: | Senior Software Engineer at Uber Technologies Inc. |
| Professional License or Qualification, if any: | | Relationship to Program, if any: | |
| **Please evaluate the following Specific Elements** | | | |
| a) Concept and overview | Is the overall concept of the degree program relevant and appropriate to current employer demands as well as to accepted academic standards?   Will the program lead to job placement? | | |
| | **Comment**<br><br>The overall concept of the degree program is definitely relevant and appropriate to current employer demands.<br><br>The program seemed more suitable for entrepreneurial purposes than job placement given how broad the range of knowledge the curriculum covers. It seems to have a focus on independence of building mobile products: covering both iOS and Android end to end development, even including product design while individual contributors in a medium to large size companies tend to focus on a smaller and more defined part of a product.<br><br>Although knowledge / sense of business and product are usually not the most important thing when it comes to hiring fresh grads, it is still important that students understand how things work outside of technologies. It is certainly a nice touch in the hiring process given a candidate passes technical bar. Not to mention that it is required for entrepreneurship if students so choose to pursue that after graduation.<br><br>Academic wise, the classes are well balanced and there are clear and pretty standard definitions of pass vs. fail. So I'd say it's relevant and appropriate to accepted academic standards. | | |

BASIT – Cascadia College

# Applied Baccalaureate External Review Rubric

| | | |
|---|---|---|
| | | The program will likely lead to entry level jobs at some companies. If not, student should have the technical strength to build a portfolio / business, which can then lead to job placements. |
| b) | Degree Learning Outcomes | Do the degree learning outcomes demonstrate appropriate baccalaureate degree rigor? |
| | | **Comment**<br><br>The program meets all the state requirements for BAS degrees. |
| c) | Curriculum Alignment | Does the curriculum align with the program's Statement of Needs Document? |
| | | **Comment**<br><br>It certainly does. It fits all the criterias detailed in the statement of need. The statement of need document has detailed the landscape of the job market and highlighted the strong demand of mobile development talent, as well as the high entry barrier for gaining related knowledge due to higher education cost and high bar for getting into the industry. The program is designed as a lower cost alternative that is just as effective. It covers the necessary topic and has more focus on practicality and hands on training that suits real world industry requirements very well. I am really impressed about the amount of thoughts that went into the design of the curriculum. |
| d) | Academic Relevance and Rigor | Do the core and elective courses align with employer needs and demands?   Are the upper level courses, in particular, relevant to industry?  Do the upper level courses demonstrate standard academic rigor for baccalaureate degrees? |
| | | **Comment**<br><br>The core and elective classes have a broad coverage. Topic wise they certainly align with employer needs and demands. The upper level courses are very close to the industry. Students will be able to gain resume-worthy experience through capstone and internship program, which is very valuable.<br><br>There are slight concerns that the curriculum may lack technical depth in mobile development given only 20/60 of the core credits are mobile development credits and it's split between iOS and Android. |

# Applied Baccalaureate External Review Rubric

| | | |
|---|---|---|
| | | However, it is still more than enough to get students into the world of mobile development and land their first job as mobile engineers. As the industry changes rapidly, the most important thing in this program should be "learn how to learn". The program seems to provide enough context knowledge so that the students would be able to carry on and self-improve after the program; The projects planned also exercises student's ability to learn new technologies and solve problems. |
| e) | General Education Requirements | Are the general educations requirements suitable for a baccalaureate level program? Do the general education courses meet breadth and depth requirements? |
| | | **Comment**<br><br>Since the curriculum meets the SBCTC's requirements for general education distribution for BAS degrees, it's certainly suitable for a baccalaureate level program. These courses should give enough foundational knowledge for a student to succeed in further study of mobile development. Non-technical skills that are useful in the working environments of mobile engineers, such as technical writing and business ethics are also vital to students' success.<br><br>Some additional suggestions:<br>• Logic is vital to basic decision making while programming. Offering, or even requiring a logic course similar to UW's PHIL 120 would be extremely helpful. |
| f) | Preparation for Graduate Program Acceptance | Do the degree concept, learning outcomes and curriculum prepare graduates to enter and undertake suitable graduate degree programs? |
| | | **Comment**<br><br>I agree with the proposal: although this program aims at teaching hands on skills for students to enter the job market as mobile engineer, if students so choose to pursue further education, they are well positioned for IT related management type masters programs given solid understanding in the technical perspective of the IT industry gained from the MoBAS program. |
| g) | Faculty | Do program faculty qualifications appear adequate to teach and continuously improve the curriculum? |
| | | **Comment** |

BASIT – Cascadia College

# Applied Baccalaureate External Review Rubric

| | | |
|---|---|---|
| | | Absolutely, the listed faculties make a strong group for the program. With the team we can see decades of industry experiences as well as extensive experience teaching computer science fundamentals and software engineering. They are totally capable of teaching and continuously improving. |
| h) | Resources | Does the college demonstrate adequate resources to sustain and advance the program, including those necessary to support student and library services as well as facilities? |
| | | **Comment**<br><br>Yes. Students have the necessary resources provided for their success in the program. |
| i) | Membership and Advisory Committee | Has the program received approval from an Advisory Committee?  Has the program responded appropriately to it Advisory Committee's recommendations? |
| | | **Comment**<br><br>To my knowledge, the program has the program received approval from an Advisory Committee. The program has also responded appropriately to it Advisory Committee's recommendations. |
| j) | Overall assessment and recommendations | Please summarize your overall assessment of the program. |
| | | **Comment**<br><br>Overall, the program is very well designed and covers all the basics and beyond to ensure students' success in career at a reasonable financial cost. Especially, I strongly endorse the periodic feedback process detailed in the proposal as I believe that iterative improvement is the key to success of building great things. I believe with such mindset this program will thrive and benefit many students.<br><br>If possible, add focus on:<br>• Data structure and algorithm<br>• Architecture: MVC + MVVM<br>As these are heavily assessed by the employers |

**Reviewer Bio or Resume**
Sullivan Zelin Liu is currently a Senior Software Engineer at Uber Technologies Inc. At Uber, he built and owned multiple mobile products.

# Applied Baccalaureate External Review Rubric

He is the founding member of the Scheduled Rides team. He has designed and architected Scheduled Rides' mobile products across platforms, built a highly reliable mobile product that currently operates in 300+ cities worldwide.

Before Uber Sullivan founded and worked at multiple startups after graduating from the University of Washington with a Bachelor of Science in Applied Computational Math Science - Discrete Math and Algorithms.

MISC: On page 8 and 9 under "Table 1: Program Assessment Methods" table, the annual review and biennial review seem to be duplicates.. Do we really need both?

BASIT – Cascadia College

# CASCADIA COLLEGE
**BOTHELL • OUR COMMUNITY'S COLLEGE**

Associate in Applied Science – Transfer
## Web Application Programming Technology – Programming Emphasis
2016-2017 Catalog • *Effective until June 30, 2017*

**Student:**_____ **SID:**_____

Requires at least **101** credits in college-level courses, a minimum cumulative 2.0 grade point average, a minimum of 25 credits from Cascadia, and completion of all requirements for this degree.

## GENERAL EDUCATION CORE COURSES      **10 CREDITS**

| ✓ Complete | Course Name and Number | Credits | Credits Remaining |
|---|---|---|---|
| | ENGL&101 English Composition I | | |
| | MATH&107 **or** MATH&141 **or** MATH&146 **or** MATH 147 **or** PHIL&120 | | |

## HUMANITIES/SOCIAL SCIENCES REQUIREMENTS      **15 CREDITS**

| ✓ Complete | Course Name and Number | Credits | Credits Remaining |
|---|---|---|---|
| | BUS&101 Introduction to Business | | |
| | CMST 105 Communication in Organizations | | |
| | Any GS designated social science course in ANTH, ECON, GS, HIST, POLS, OR PSYC | | |

## PROGRAM REQUIREMENTS      **61 CREDITS**

| ✓ Complete | Course Name and Number | Credits | Credits Remaining |
|---|---|---|---|
| | BIT 102 Networking Fundamentals | 5 | |
| | BIT 105 Careers in Information Technology | 2 | |
| | BIT 112 Basics of Web Authoring | 5 | |
| | BIT 113 User Interface Development | 5 | |
| | BIT 115 Introduction to Programming | 5 | |
| | BIT 116 Scripting | 5 | |
| | BIT 142 Intermediate Programming | 5 | |
| | BIT 158 Beginning Database | 1 | |
| | BIT 159 Advanced Database | 1 | |
| | BIT 160 Digital Imaging | 1 | |
| | BIT 161 Vector Graphics | 1 | |
| | BIT 220 Elements of Project Management | 5 | |
| | BIT 275 Database Design | 5 | |
| | BIT 276 Database Implementation | 5 | |
| | BIT 285 Application Programming | 5 | |
| | BIT 286 Web Applications | 5 | |

## PROGRAMMING EMPHASIS REQUIREMENTS      **10 CREDITS**

| ✓ Complete | Course Name and Number | Credits | Credits Remaining |
|---|---|---|---|
| | BIT 143 Programming Data Structures | 5 | |
| | BIT 265 Structures and Algorithms | 5 | |

## PROGRAM REQUIRED ELECTIVES      **5 CREDITS**

Students should choose a combination of the following variable credit courses for a total of **five credits**.

| ✓ Complete | Course Name and Number | Credits | Credits Remaining |
|---|---|---|---|
| | ☐ BIT 197 BIT Work-based Learning I **OR** ☐ BIT 297 BIT Work-based Learning II<br>☐ BIT 199 Service Learning in BIT I **OR** ☐ BIT 299 Service Learning in BIT II | 5 | |

**Advisor:**_____ **Date:**_____

### Cascadia College Student Advising & Support Services
### 425.352.8860 / *advising@cascadia.edu* / Kodiak Corner