

**Docket Item:**

Community College Approval: Klamath Community College, Associate of Applied Science Degree in Laboratory Technician, within 41.0000, Science Technologies/Technicians, General.

**Summary:**

Klamath Community College proposes a new Associate of Applied Science Degree in Laboratory Technician. Higher Education Coordinating Commission (HECC) staff completed a review of the proposed program. After analysis, HECC staff recommends approval of the degree as proposed.

**Staff Recommendation:**

The HECC recommends the adoption of the following resolution:  
RESOLVED, that the Higher Education Coordinating Commission approve the following degree: AAS in Laboratory Technician.



**Klamath Community College seeks the Oregon Higher Education Coordinating Commission's approval to offer an instructional program leading to an Associate of Applied Science Degree in Laboratory Technician.**

### **Program Summary**

The Laboratory Technician Associate of Applied Science degree is offered to students seeking employment in Scientific Laboratory Technology and Field Work occupations. The degree offers options in Biological Technician, Wildlife Biologist, Chemical Technician, and Forensic Science.

To earn the Laboratory Technician AAS degree, students must satisfactorily complete all the requirements of the degree including a minimum of 100 credits, 45 of which are in the General Education Component. The General Education requirement allows the flexibility to continue professional development later, by applying the basic skills gained to more in-depth study.

Core Outcomes of this degree emphasize a comprehensive skill set of theory and application. The broad scope is meant to provide the student with the most competitive tool set in this high-placement occupation. These outcomes include, but are not limited to application of concepts in chemistry, biology, genetics, microbiology, anatomy and physiology, health and sanitation, hazardous disposal, laboratory techniques, quality assurance, research methodology, and statistical methods. From an academic perspective, it is important to assimilate, vocabulary, theory, critical thinking, synthesis, and the professional aptitude necessary to be effective in the field.

Successful pursuit of this degree requires students to possess collegiate skills in reading, communication, computation, and critical thinking. To acquire that competency, it is highly recommended that students complete pre-collegiate courses to gain these skills prior to their entry into the program.

The first year of the AAS degree program offers technical emphasis coursework and completion of prerequisites. The second year covers a broad range of skills, including those necessary for diversification and upward mobility within the occupational area.

**1. *Describe the need for this program by providing clear evidence.***

The two year Laboratory Technician AAS degree is intended to emphasize job titles with cross-disciplinary skills generally entitled by the Labor Market as Laboratory Technicians. The skill set is intended to provide the broadest range and, consequently, employability in laboratory and field

research. This program is intended to provide an intentional curriculum to maximize employability. Knowledge, skills, and abilities target occupations in a broad spectrum of the Standard Occupational Classification (SOC) 19-40XX family. For example, Biological Technicians (194021); Chemical Technicians (194031); Environmental Science and Protection Technicians (194091); Forensic Technicians (194092); and 19-102X family such as Microbiologists (191022) and Wildlife Biologists (191023).

There are 11 immediate openings in Klamath Falls and 427 openings in the East Cascades region.

- The expected immediate growth of the various occupations targeted in this family ranges from 9.3 to 20.4% with an average 12.6% as reported by the Oregon Department of Employment. This projects an additional 580 employment positions in the state of Oregon over the next decade.
- Currently only one Oregon community college provides instruction specific to Laboratory Technician Occupations. Portland Community College functions as a feeder for Oregon Health Sciences University (OHSU) and rightly emphasizes transfer over employment of their students.
- Average hourly wage ranges from \$20.27 to \$35.53 an hour and annual salaries range from \$38,968 to \$73,906.

Can training currently be provided without creating a new program?

The intentionality of this program provides both current and aspiring students with a structured cohort modality with a purposeful end in mind: Laboratory and/or field research employment opportunities. While the flexibility of degrees such as the Associate of Science (AS) attracts students with the specific intention of transfer, this Laboratory Technician degree is intended to optimize employability without sacrificing transferability. Three important traits characterize this program: a negligible margin for choice (no electives), purposeful selection of courses to maximize knowledge, skill, and abilities for this occupation range, and the fastidious selection of courses necessary to glean specific skill sets for employability. It is these three essential traits that makes this program unique.

What data sources have been used in addition to the Employment Department, e.g. professional organizations, national census and regional workforce specialists?

The sources consist of the United States Bureau of Labor Statistics, the state of Oregon Employment Department, and the Environmental Systems Research Institute (ESRI) employment statistics.

What employment opportunities, career advancement and opportunities for additional training exist for students who complete the program?

Contingent of success of this program, an additional emphasis includes Medical Laboratory Technician, a high-demand, high-reward occupation. Additionally, the degree may be used as an Associate of Applied Science (AAS) transfer.

**2. *Does the community college utilize systemic methods for meaningful and ongoing involvement of the appropriate constituencies?***

Who are your key constituents and how have they helped design your program?

In order to hone the skill set necessary for a successful student cohort, local community partnerships have been cultivated and asked to participate in the furtherance of their education by providing:

- Volunteer hours for cooperative work experience (GIS 280).
- Members of advisory committees
- College customized training and development
- Certifications (ESRI, ACS)

These partners have been chosen to maximize student experience:

- Sky Lakes Medical Center
- Klamath Falls Fish and Wildlife
- Jeld-Wen Research and Development
- Klamath Vector Control District
- American Chemical Society (ACS)
- Environmental Systems Research Institute (ESRI)
- KCC Science Club

What resources are your constituents contributing?

- The most important resource that these partnerships have agreed to provide is cooperative work experience. On-the-job experience and training are key in the success of the student cohort.
- Partners choose to participate in advisory committees in an effort to continue honing the program skill set.
- Certification by ESRI in introductory ArcGIS is invaluable in achieving student employment.
- Assessment by ACS provides transfer of our organic chemistry as a 300-level course at Oregon State University.

What college programs are helping you shape and implement your program, e.g., student services, developmental education, second language programs?

Klamath Community College Klamath Center for Education and Training (KCC-K-CET). KCC-K-CET is positioning itself to provide their GED graduates with the opportunity to pursue the Laboratory Technician Program.

ESL students are guided into KCC-K-CET. Therefore, partnership with KCC-K-CET implies recruitment of minority students as well. The KCC Science Club is working with our external programs coordinator to implement the high school STEM fair. The intent is to recruit local student talent from the fair while providing high school students with validation via scholarship, publishing, and/or internship.

Do you have national constituents involved in program design and resource sharing?

The American Chemical Society (ACS) will be proving National Assessment and Certification of the Organic Chemistry component in the curriculum.

How will this program meet your partners' needs?

Ultimately, the goal is to provide trained, local employees. Our partners would benefit from the opportunity to hire an optimally trained workforce guided by their directives.

3. ***Is the community college program aligned with appropriate education, workforce development, and economic development programs?***

Meetings with local partners and their participation in the advisory committee have guided the curriculum and honed the student skillset. The most valuable contribution comes from Sky Lakes Medical Center. Their guidance is of particular significance as we aspire to add the Laboratory Medical Technician emphasis.

The GIS 280 CWE component is structured as a laboratory component to maximize contact hours with our local business partners. This is in conjunction with the laboratory component of GIS 234 (an additional 3 hours) that will provide the student with a total of fifteen contact hours of internship experience with local business partners.

The program supports the state's initiatives by recruiting minority, at risk, and non-traditional students into a STEM intensive program. The program is designed with minimal prerequisites and maximum contact hours to allow these populations the opportunity to become competitive in traditional academic environments and professional employment.

The recruitment is a multi-pronged approach consisting of the following:

- Engage local public and private high schools by inviting students to participate in a competitive STEM Science Project hosted by the KCC Science Club and facilitated by our external programs coordinator. Participants will be introduced and, subsequently, encouraged to take advantage of the opportunity presented by the Oregon Promise Grant.
- Recruitment of ESL (minority groups) and GED students through KCC-K-CET program.

- In collaboration with the Oregon Employment Department, assimilate non-traditional displaced workers who demonstrate an affinity for STEM-intensive disciplines

Workforce education needs are being met by increasing accessibility. The vast majority of the curriculum may be taken as distance education (DE) courses. Even advanced topics such as Microbiology are being converted to DE in an effort to maximize accessibility. Only a handful of courses that are instrument-intensive must be taken face-to-face. This consists of three series, two in Biology and one in Chemistry, which account for forty (40) out of a hundred (100) credits. This means that students may choose to take 60% of the courses in the convenience of their homes.

Due to KCC's diligence in dual credit, high school students may choose to take the courses synchronously with KCC (the course is televised from KCC to the high school); at their high schools through dual credit articulations; or take the course at KCC by either modality (face-to-face or distance-education) at a cost of \$25.00 per credit. Again, this infrastructure is due to KCC's diligence in maximizing high school student accessibility. This program takes full benefit of this institutional infrastructure by providing an entire year of electronic accessibility for the high school student.

This is a traditional AAS that is distinguished only by its rigor. As such, the AAS follows the model of all of our sister institutions. The intent is to allow the student to transfer to a sister institution without loss of credit. The program is aligned with Oregon State University.

At this time, the program is intended to gain two certifications. One certification will be in Geographic Information Systems (GIS) from ESRI and a second certification will be obtained from the ACS Organic Chemistry assessment. The latter is criteria imposed by OSU for transfer of KCC's Organic Chemistry as a 300-level course. Contingent on the rate of growth of the program, a future certification for Medical Laboratory Technician (MLT) will be sought out from the American Society for Clinical Pathology (ASCP) as a secondary emphasis of the program.

4. ***Does the community college program lead to student achievement of academic and technical knowledge, skills, and related proficiencies?***

Is the program designed to meet the need stated in Standard A?

Once the student reaches the collegiate-level writing and math skills, their STEM success is optimized by choosing courses such as BIO 240, Forensic DNA Biology, as their initial introduction to the rigors of science. This course was designed for the Criminal Justice Certificate for students without traditional math and science prerequisites. The course maximizes student success by providing high contact hours. This approach has been put to the test in two previous iterations. In each instance, 95% of the students earned an A, despite the absence of math and STEM prerequisites.

Are learner outcomes clearly identified?

The knowledge, skills, and abilities gleaned by students in this program are vast. The outcomes of each course will be guided by the purposefully prepared Course Content and Outcomes Guide (CCOG). The outcomes of the program may be abbreviated as follows:

Provide student with an AAS containing a broad berth of STEM courses for maximum transferability.

Provide students with experience in state-of-the-art instrumentation to optimize their opportunity for employment.

- Provide students with an introduction to GIS to further augment their employability with laboratory and fieldwork research employers.
- Provide the student with cooperative work experience and internships to further improve their employment by local business partners.
- Promote professionalism and the soft skills necessary to maintain employability

Does the program facilitate student achievement and transition?

As addressed before, the student may choose to transition to alternate degrees by the substitution of a single series. The transition to the emphasis of MLT also may be achieved by the substitution of a single series of courses.

How are career information and counseling incorporated? Are tutoring and mentoring provided?

KCC will be providing a College General Studies (CGS) 99, a 1.00 credit career exploration and planning elective to more closely associate the student with the options presented by the LT AAS degree. The program lead will provide cohort academic advising. The Learning Resource Center (LRC) provides tutors for all but three courses in the program.

How will data be used for continuous program improvement?

Three measures will be used to assess program success:

- Student employment
- Employer satisfaction
- Student transfer

Contingent on these outcomes, the advisory committee consisting of local business partners and consequently employers may continue to hone the student skill set.

How is academic and technical rigor addressed?

Academic rigor will be addressed to traditional means: homework, assessments, and projects. Technological rigor will be addressed by assessment of student performance in manual protocols such as breaking-down, cleaning, setting-up, and running instrumentation with instrument-specific controls.

5. ***Does the community college identify and have the resources to develop, implement, and sustain the program?***

What impact will this program have on current school programs and budgets?

The impact of this program on other programs is negligible. Again, the reason is because the program consists of a repackaging of current course offerings in a purposeful and relevant way to maximize student employment in STEM-related, technologically-intensive environments. It is expected that the proactive recruitment associated with the program will only serve to increase foot traffic in the science discipline and, in effect, augment the discipline's Cost Margin Analysis. There is only one new course offering, Geographic Information System (GIS) 234. The employability of a student with an introduction to GIS far outweighs the cost of an additional course. Historically, GIS instruction has been cost prohibitive because of the very expensive, proprietary software necessary to bring about instruction. Thanks to providers such as ESRI, this is no longer the case. ESRI now provides a web-based computer-shell that allows students to interact and learn from a problem-based virtual interphase at a very small fraction of the software price. The one year subscription may therefore be attributed to laboratory fees for this lab course.

Agreements with local business partners allow us to provide CWE and internships at no additional cost. The cost of the ESRI GIS certification and ACS Organic Chemistry assessment would be embedded in laboratory costs paralleling the embedding of the certification and assessment in the curriculum. Finally, the Instrumental infrastructure was purchased with state matching funds and incorporated into flagship science courses of the President's Strategic Plan. This means that the state-of-the-art instrument infrastructure is present and ready for use at no additional cost.

What is the student/teacher ratio?

The Science Department consists of five full-time science faculty. Optimally, a cohort of 12-24 students is expected at the first offering. The student to teacher ratio would be 5:1. KCC prides itself in small class room sizes and low student to teacher ratios yielding student success.

Will course fees support the cost of instruction; if not, how will revenue be generated?

Course fees are already assigned to laboratories proportional to the cost of the laboratory per student. Except for GIS 234 lab, no new course fees will be assessed.

### ***Assurances***

Klamath Community College has met or will meet the four institutional assurances required for program application.

1. *Access.* The college and program will affirmatively provide access, accommodations, flexibility, and additional/supplemental services for special populations and protected classes of students.
2. *Continuous Improvement.* The college has assessment, evaluation, feedback, and continuous improvement processes or systems in place. For the proposed program, there will be opportunities for input from and concerning the instructor(s), students, employers, and other partners/stakeholders. Program need and labor market information will be periodically re-evaluated and changes will be requested as needed.

3. *Adverse impact and detrimental duplication.* The college will follow all current laws, rules, and procedures and has made good faith efforts to avoid or resolve adverse *intersegmental* and *intra-segmental* impact and detrimental duplication problems with other relevant programs or institutions.
4. *Program records maintenance and congruence.* The college acknowledges that the records concerning the program title, curriculum, CIP code, credit hours, etc. maintained by the Office are the official records and it is the college's responsibility to keep their records aligned with those of the Office. The college will not make changes to the program without informing and/or receiving approval from the Office.