Program Review Report
3.7 Academic Program Review

A thorough internal or external program review addressing all criteria in policy should be possible within a comprehensive report of ten or fewer pages. This template is provided to assist institutions in compiling the program review information, **which is to be presented to the institutional governing board prior to submission to the State Regents**. Please provide an executive summary of this review using the Program Review Executive Summary Template.

Institution Name: Oklahoma City Community College

Program Name and State Regents Code: Physics Associate in Science 167

List Program Options: N/A
List Embedded Certificates included in this review: N/A

Previous Review

Date (Year) of Last Review 2011

1. Summarize key findings from previous internal and/or external reviews of this program.

Prior to 2012, all science programs (chemistry, physics, and biology) were under one degree program (A.S. Science); a student who followed, for example, the pre-pharmacy curriculum or the biology curriculum pattern was awarded an A.S. in Science. The last program review in FY 2010 was a review of this science program, covering biology, chemistry, and physics all together in one document.

In 2012/2013 the Science, Engineering, and Mathematics Division was split into the Chemistry and Biological Sciences Division and the Mathematics, Engineering, and Physical Sciences Division. We applied to have separate chemistry, physics, and biology programs recognized by the Oklahoma State Regents for Higher Education. Because there were questions about whether we would have enough graduates to justify some of the programs, the State Regents gave OCCC provisional approval for the separate chemistry, biology, and physics programs and degrees. We do not have the official documentation of this provisional approval, but assume there would be a record of it in the files of the office of Curriculum and Assessment or other institutional office.

According to Chapter 3 of the Oklahoma State Regents' *Policy and Procedures Manual*, provisional approval of a program "will place the program in a post-audit status for a specified period of time for the program's operation and include specific enrollment and graduate criteria developed in cooperation with the institution to be met if the program is to continue beyond the specified date." (pp. 46-47)

Because of the provisional program approvals and post-audit status, OCCC had to submit productivity reports in FY 2018 for biology, chemistry, and physics degrees to demonstrate we were meeting the agreed-upon enrollment and graduate targets before biology, chemistry, and physics. Only after demonstrating we had sufficient numbers of students and graduates were biology, chemistry, and physics officially recognized as programs subject to the five-year review

process. The first subsequent official program reviews were scheduled for FY 2023. Copies of these reports should also be available in the appropriate offices.

The following findings pertained primarily to what at that time was the "physics concentration" within the science degree program.

Strengths (2011):

Quality faculty: Science faculty at OCCC are a diverse group who share a common interest in promoting student learning, providing quality instruction and insuring high levels of student performance. While science courses are taught by adjunct faculty, every attempt is made to ensure they hold high qualifications and support the goals of the department.

The physics faculty include: a physics generalist interested in practical applications of physics concepts in everyday life and an astrophysicist who teaches astronomy and the higher-level physics courses employing cooperative learning techniques. In addition, the Dean of Science and Mathematics is also an astrophysicist who understands and strongly supports the efforts of physics faculty.

Designed curricula. Unlike many institutions where faculty simply teach the textbook, faculty at OCCC have conscientiously *designed* the courses and curriculum. Courses are developed by first determining what knowledge and skills students are expected to acquire. Competencies or learning objectives are specified based on content significance, prerequisites for future subjects and courses, and importance to the careers students are pursuing. These objectives are then sequenced, and course materials are developed. Textbooks are selected which most closely match the course design. Finally, assessments are developed which match the specified learning objectives. All sections of each course use the same set of objectives, ensuring students in every section receive an equivalent education regardless of teaching methods utilized by individual instructors.

Classroom technology. All classrooms at OCCC are equipped with computers and projectors that allow instructors to present multimedia materials and access the Internet in the classroom. The general classroom environment is also very positive. The use of tables rather than individual desks allows students more room to work. The white boards in the classrooms are generally more visible and involve less dust than chalk boards.

Lab facilities. The equipment and facilities for physics lab experiments are superb.

Schedule and format options. Both basic and more advanced science courses are offered in the morning, afternoon, and evening. Many of the basic science courses are offered in an 8-week or 16-week format. The variety of time offerings and formats for science courses helps serve students with diverse scheduling needs.

Science Center. The Physical Science Center provides extensive services to students such as free tutoring.

Engineering Center. The Engineering Center, although designed primarily for engineering students, provides an environment that encourages learning and collaboration for physics

students as well as engineering students. Most of the physics faculty offices are inside the Engineering Center.

Specialized curriculum patterns. Program faculty have designed suggested curricular patterns for students to follow that meet the transfer requirements for further study in these areas. Even students who self-advise should have a reasonable idea of what courses they need if they follow one of the published curriculum patterns.

Expanded course offerings. Since the last program review, a new course, PHYS 2223, Modern Physics, has been added to help students following the Physics curriculum pattern who plan on transferring to a four-year college of university for further study in physics.

Faculty advising. A very large number of students taking science courses have one of the professional medical specialties as a career goal: medicine, pharmacy, dentistry, nursing, and all of the allied health professions. These academic majors are housed in the Division of Science and Mathematics.

While the College employs several dedicated general Academic Advisors, these general advisors cannot possibly remain current on employment trends, advanced programs available at transfer institutions, program admission requirements, etc. Consequently, science faculty members have taken on the responsibility of serving as Faculty Advisors for students selecting these majors. Science faculty also remain in contact with faculty and staff at various educational and medical institutions to ensure programs offered at OCCC meet the needs of students pursuing careers in the various fields of medicine.

Concerns Identified (2011):

Transfer issues. The Physics Department at the University of Oklahoma is accepting our Engineering Physics courses, but because their physics-for-majors courses are five credit hours with a lab component while our courses are four hour courses with a lab component, transfer students are sometime required to take a freshman-level physics lab course to make up for the deficiency in hours.

(2023) All physics courses (engineering physics, college physics, modern physics, astronomy) except for PHYS 1013/1014 are listed in the State Transfer Matrix and so should have no transfer issues, aside from the laboratory complication.

Outcomes assessment in physics. In physics there are some national assessment standards to apply in order to evaluate outputs, and information from final exams with which to evaluate learning outcomes, but these are applied to both students emphasizing physics within the Science program as well as engineers and other non-program students. This makes evaluating the program for majors difficult and makes the amount of work involved for assessment seem unproductive. When the criteria are applied just to the program students, the numbers are often so small that the meaning and validity of the results are questionable.

(2023) The concern indicated with outcomes assessment is still a valid one. Assessment reports indicate the performance of all students enrolled in the courses and not just the majors; we should note the performance of the physics majors students alone as well.

Availability of output data. Data for tracking science student success at transfer institutions and admission to professional programs seems impossible to obtain.

(2023) We should be tracking program students' bulk GPA after transfer (at least anonymously), but that would require a state tracking system that (we don't think) yet exists.

Availability of qualified adjuncts. We rely heavily on just a few adjuncts to teach close to the maximum allowable hours. While every attempt is made to ensure that highly qualified individuals are hired, qualifications on paper do not always translate into success in the classroom.

(2023) Program courses (PHYS 2014/2114/2223) are taught only by full-time faculty, so this issue is primarily frustrating for support courses.

Physical Science Center staffing. We are short-staffed in the Physical Science Center. Physics faculty have long felt that a lab assistant with a strong background in physics was needed to help with material inventory control and equipment repair. While equipment repair is no longer a real concern (it's probably cheaper to just replace broken equipment), inventory control is still lacking. More importantly, there are times when only one lab assistant can be scheduled to work, making it difficult for the assistant on duty to attend to the needs of chemistry labs going on in three different rooms, supervise IP physics labs, schedule labs for students who come in to the Physical Science Center, address questions regarding computers, and have time for any kind of break. If one lab assistant has to call in sick, there are times when we will have to close the Physical Science Center, causing rescheduling of IP physics labs. Also, a lab assistant on duty alone cannot prepare chemicals or refill bottles in labs to make sure early morning labs are adequately stocked due to safety concerns in case of an accident.

(2023) There is a salaried, full-time Lab supervisor and two full-time Lab assistants, so issues recently with physics labs have been rare.

Need for enhanced tutoring services. The Physical Science Center currently relies upon student tutors exclusively. The student tutors we currently utilize are often here for only a year and then they move on. This means that tutor quality can vary considerably from year to year and is strongly dependent upon the applicant pool.

(2023) The above is still true, though in the Engineering Lab there is typically at least one tutor available at any given time as well as the full resources of the Math Lab.

Unresponsiveness of Human Resources. Faculty and program directors involved in posting positions and hiring lab assistants or tutors are often frustrated by how long it takes Human Resources to process requests to get jobs posted or to process paperwork. Often there is no communication when background searches are completed. Delays of several weeks are not uncommon for position postings, leading to unfilled positions that can impact services to students and creating uncertainty for potential candidates awaiting the job postings.

(2023) HR responsiveness is notably better and not the pressing concern of past years.

Recommendations (2011):

Classroom space. Short term: Any new construction on campus needs to include space that can be used for classrooms. Longer term: Consider construction of a separate Science Building that includes new classrooms, offices, and lab spaces.

(2023) Offering some online sections has alleviated the severe classroom shortage for now.

Transfer issues. Some state institutions will probably never accept some of our courses. Unless the State Regents step in to ensure transferability of comparable courses, the best we can do is to make sure students leave OCCC with suitable skills to demonstrate that there is no need to unduly punish our students because they come from a community college.

(2023) Program courses are in full cooperation with the State Transfer Matrix.

Outcomes assessment in physics. Some of the suggestions from the Academic Outcomes Assessment Committee should be implemented to see if better assessment data can be produced for the physics emphasis students.

(2023) We have implemented a new 5-year Assessment Plan with strategies to assess each of the program courses and laboratories in comprehensive physics knowledge as well as use of pre-requisite mathematics. Separately noting the performance of physics-major students would be a good addition.

Availability of output data. Make the Oklahoma State Regents for Higher Education aware that output data, such as the success of science students after transferring to science programs at other institutions, is incredibly difficult to obtain without a statewide database accessible by Institutional Effectiveness.

(2023) Still a perennial wish-list item.

Need for full time faculty. Add a physics faculty position and either a combined engineering/physics position or separate engineering and physics faculty.

(2023) This was a continuing need, and even more pressing at the current date due to a sudden physics resignation. We cannot offer the number of sections we used to because of a lack of full-time faculty positions.

Need for lab assistant training. In addition to having lab assistants work through all the physics labs, the Physical Science Center supervisor should provide additional training for some of the more complicated physics labs, involving full time faculty in the training as needed.

(2023) No issues with a lack of lab training is noted currently. Program courses with labs are taught in a "group" lab format under the supervision of the full-time faculty member who teaches the course.

Need for enhanced tutoring services. Hire a combined full-time tutor/ student tutor supervisor with a background suitable to tutor the whole range of chemistry and physics courses at OCCC. A full-time tutor/tutor supervisor could provide training to the student tutors to improve consistency and increase the number of hours during which students could find assistance with their chemistry and physics homework.

(2023) We don't have a full-time tutor, but many part-time student tutors are now available in the Physical Science Lab, Engineering Lab, and Math Lab.

Unresponsiveness of Human Resources. Ask the Dean's Council and the Vice-President for Academic Affairs to encourage the President's Cabinet to find the needed action to increase responsiveness of Human Resources and their communications with program directors and to reduce paperwork turn- around times.

(2023) As noted above, this does not appear to be a current issue.

Large advising loads. Lists of advisees should be purged of students who have graduated or who have not enrolled in 18 months to give faculty a more accurate picture of their advising load. Hiring more faculty would spread out the advising load.

(2023) Advising loads have been largely lifted from faculty and shifted to the Advising office.

2. What developments and actions have taken place since the last review?

Three full-time physics faculty have retired/resigned, 2 have been hired (one of those teaches only physics), so we're currently at a disadvantage as compared to the previous era.

Many sections of Engineering Physics and Astronomy have now moved to OER textbooks, lessening the financial burden on our students and easing access.

The Astronomy with Lab course (1514) now implements a new and exciting curriculum in partnership with 30+ other institutions whereby (gen-ed!) students can request observations from robotically controlled professional telescopes around the world, digitally process the images, and conduct real scientific inquiries in class. The curriculum is built around the "distance ladder" concept taught in the survey course, where we use different techniques to determine the distances to many different kinds of galactic and extra-galactic objects.

All physics labs are now conducted in a "group lab" format, where students in a particular section all take the same lecture/lab together (as opposed to the older model that included "individually paced" (IP) labs that were conducted by students independently). We found that group labs fostered a much more "loose" lab experience that encourages inquiry and free experimentation, as well as peer tutoring in techniques and analysis.

Current Review

Date (Year) of Current Review 2022-2023

Review Criteria *(Institutions should address each criterion of OSRHE policy 3.7.5 as directed below).*

A. Centrality of the Program to the Institution's Mission:

The mission of the college is "**Student Success. Community Enrichment."**

The Physics program's strengths, identified above and still applicable, support this mission with a dedicated group of strong classroom professors who take students from the local community who dream of becoming physicists and engineers and developing their skills to the point that they can transfer to a 4-year institution and compete for degrees, honors, and ultimately successful careers.

B. Vitality of the Program:

1. Program Objectives and Goals:

The goal of the OCCC Physics Program is for AS Physics students to successfully move on to and graduate from Physics or related programs at 4-year institutions.

2. Quality Indicators (including Higher Learning Commission criteria and requirements):

We use standardized and peer-reviewed inventories like the FCI (Force Concept Inventory) and the CSEM (Conceptual Survey of Electricity and Magnetism) for PHYS 2014 and PHYS 2114 (respectively) to gauge student learning gains. These are administered nationally at peer institutions so direct comparisons with other student populations is easy. Since beginning this kind of measure (about 15 years ago), students at OCCC routinely achieve higher learning gains than those at other 4-year universities.

The following measures are evaluated on a rotating basis (each at least once per 5-year assessment term):

- Average scores for all on-campus students taking the nationally standardized FCI exam relative to initial scores (called the "normalized gain", a typical metric used in education research).
- Use scores on comprehensive final exam to indicate overall achievement at the end of the term and to establish robustness of both the FCI and our exams.
- Average scores for all on-campus sections of students taking the nationally standardized CSEM exam.
- Use scores on comprehensive final exam to indicate overall achievement at the end of the term and to establish robustness of both the CSEM and our exams.

- Average score of all on-campus students taking the nationally standardized College Test of Scientific Reasoning (another standard inventory measuring critical reasoning).
- Course coordinators choose an experiment utilizing Maximum Accountable Error and evaluate student conclusions regarding experimental outcomes with calculated uncertainties.
- For PHYS 2014 (Physics 1), the course coordinator identifies a particular laboratory exercise or test question in which students demonstrate an understanding of how to use calculus (a course pre-requisite) to find the rates of change of physical variables or averages of physical variables.

3. Minimum Productivity Indicators:

Time Frame (e.g.: 5-year span)	Enrollment	Graduates
FY2018	22	3
FY2019	30	0
FY2020	31	3
FY2021	41	2
FY2022	40	3

4. Other Quantitative Measures:

   a. Number and enrollment of courses taught exclusively for the major for each of the last five years:

   The only courses taught exclusively for the major were **2000-level**:

   PHYS 2014 — Engineering Physics 1
   PHYS 2114 — Engineering Physics 2
   PHYS 2223 — Modern Physics

FY	Courses	Avg. Size	Total Enrolled
2018	26	25	652
2019	24	21	496
2020	18	24	426
2021	22	23	499
2022	21	23	473

b. Student credit hours by course level (i.e. 1000, 2000) generated in all major courses in the degree program for five years:

Only 2000-level courses are major courses:

FY2018: 2,583
FY2019: 1,975
FY2020: 1,694
FY2021: 1,996
FY2022: 1,884

c. Direct instructional costs for the program during the review period:

In 2021 and 2022, our Information Technology Services department installed Zoom room technology in multiple classrooms across campus with an end goal of 70+ rooms. This hybrid/Hy-Flex technology helps us offer different course modalities and allows us to meet student and employee needs by providing the opportunity for courses and meetings to be held in-person and online simultaneously. This endeavor was achieved at a total cost of $2,393,437.41. In addition, all teaching station computers, monitors and display adapters were replaced at a total cost of $107,167.16.

The Center for Learning and Teaching developed training for this technology that began in Dec. 2021. This training is ongoing and focuses on both how to operate the technology as well as how to engage students with it in the classroom using innovative teaching strategies. We have trained 160+ faculty and staff members to date and anticipate training more in the upcoming fiscal year.

At this point, all course sections now use our Learning Management System (LMS), Moodle, and we have several third-party tools available to faculty and students that foster online engagement, including Turnitin, Ally, Poll Everywhere, and VoiceThread. These recurring costs add up to approximately $338,000 per fiscal year. Faculty are trained in these resources, and the CLT continues to work with faculty to make sure they understand best practices for how to use and implement these resources. Turnitin aids with grading and academic integrity, Ally with ensuring faculty have the tools to make their course materials Section 508 complaint, Poll Everywhere with student engagement, and VoiceThread with creating quality audio presentations and feedback for our students. Additionally, the Center for Learning and Teaching is working toward developing augmented and virtual reality resources for

OCCC faculty to potentially integrate into their courses to better engage students through real-world experiences offered in a virtual environment.

d. The number of credits and credit hours generated in the program that support the general education component and other degree programs including certificates:

There are 32 General Education credit hours in the Physics program degrees. 5,485 credit hours were earned in FY2022 by students in the Physics program.

General education artifacts from students in PHYS 2014/2114/2223 have not been collected and submitted; these courses are required of majors and are not typically taken as a general education elective by students in other disciplines.

e. A roster of faculty members, faculty credentials and faculty credential institution(s). Also include the number of full-time equivalent faculty in the specialized courses within the curriculum:

Faculty	**Credential (i.e. MFA, PhD)**	**Institution that granted degree**
Mia Debruyne	Click here to enter text.	Click here to enter text.
Ivana Pavic	Click here to enter text.	Click here to enter text.
Cecil M. Simmons	Click here to enter text.	Click here to enter text.
Tad Thurston	Ph. D	University of Oklahoma

Add more rows if needed

f. If available, information about employment or advanced studies of graduates of the program over the past five years:

Not enough graduating students from the Physics program responded to graduate surveys over the past 5 years to address this question.

g. If available, information about the success of students from this program who transferred to other institutions:

Not enough graduating students from the Physics program responded to graduate surveys over the past 5 years to address this question. While we do have access to data regarding students transferring from OCCC to area 4-year schools, we have no mechanism for determining which of those students were from the Physics program.

5. Duplication and Demand:

In cases where program titles imply duplication, programs should be carefully compared to determine the extent of the duplication and the extent to which that duplication is unnecessary. An assessment of the demand for a program takes into account the aspirations and expectations of students, faculty, administration, and the various constituents served by the program. Demand reflects the desire of people for what the program has to offer and the needs of individuals and society to be served by the program.

Address Duplication: Most other 2- and 4-year institutions also have a physics major for students wishing to eventually enter the workforce with a Bachelor's degree or (perhaps more often) follow their basic research or teaching interests into graduate school. Our program is somewhat special in that it's an open-access and affordable chance for *anyone* interested in this field to attempt the degree.

Address Demand: As with most of our other programs, demand for our courses comes from the population in the metro area (Choctaw, Edmond, Moore, Mustang, Norman, Oklahoma City, Tuttle, Yukon).

a. Describe demand from students, taking into account the profiles of applicants, enrollment, completion data, and occupational data:

The majority of students in our program courses are engineering majors for whom these courses are required; given that engineering is perennially one of the top majors for income potential after graduation, our courses are naturally in demand and frequently waitlisted (see below).

b. Describe demand for students produced by the program, taking into account employer demands, demands for skills of graduates, and job placement data:

Students in the program are almost universally intending to transfer to a 4-year institution to complete (at least) their BS degree in either engineering or physics. The employment outlook for physics graduates is very good — the National Bureau of Labor Statistics predicts 8% annual growth in the next 10 years, and the median salary earned by graduates is about $150,000. The unemployment rate for physicists is typically half of the overall rate, or less than 2% presently, so physicists are in demand for virtually all sectors of modern science and technology.

https://www.bls.gov/ooh/life-physical-and-social-science/physicists-and-astronomers.htm

c. Describe demand for services or intellectual property of the program, including demands in the form of grants, contracts, or consulting:

The Physics program does not have demands for services or intellectual property of the program, including demands in the form of grants, contracts, or consulting.

d. Describe indirect demands in the form of faculty and student contributions to the cultural life and well-being of the community:

OCCC Physics faculty, in the past, have served as invited speakers for public events at the University of Oklahoma, the Oklahoma City Astronomy Club, asked to host public telescope viewing events at the college, and have been guests a number of times for public podcasts. We have also been oft-interviewed for local Pioneer science articles. Faculty are typically active in national organizations, attending and presenting at local and national conferences.

e. The process of program review should address meeting demands for the program through alternative forms of delivery. Describe how the program has met these demands:

The Physics program offers on-campus, online, and hybrid (for Astronomy) sections each term. These sections are offered at different times of day to meet student demands as well as respecting conflicts with pre- or co-requisite courses. Anecdotal evidence is that students much prefer 16-week, in-person sections to online for major coursework, so we have been returning more sections to campus as the pandemic restrictions wane.

6. Effective Use of Resources:

(Resources include financial support (state funds, grants and contracts, private funds, student financial aid); library collections; facilities including laboratory and computer equipment; support services, appropriate use of technology in the instructional design and delivery processes, and the human resources of faculty and staff).

The Physics program has a chair, 2 full-time faculty teaching major courses, and one faculty member with duties split between Geology and Physics. The Chair of the Physics program and one of the full-time Physics program faculty have doctorate degrees in their respective disciplines. The faculty has a wide variety of experience ranging from purely academic backgrounds to those with years of industry experience in addition to their academic credentials. Additional personnel in the Physics program include the supervisor of the Physical Science Center and two physical science lab assistants.

In recent years, 100% of major sections were taught by full-time faculty. We feel this is a desirable goal and accomplishment, as devoting full-time faculty to the coaching and nurturing of majors indicates that these students and this program are worthy of our investment of time and expertise.

The Physical Sciences Center (PSC) serves as a tutoring center for students in the Physics program in addition to providing a space for make-up labs and to study course material. The PSC houses several computers which can facilitate learning of lab materials as well as serving as a computer lab for all OCCC students who may need the

use of a computer. The PSC staff provides tutoring services and prepares and sets up lab materials for lab courses in the program.

The PSC staff continually served students, including during the pandemic shutdown where they worked virtually to assist students. Over the past five years, thousands of students have been served by the PSC. Due to pandemic and staffing issues, the PSC has had to minimize their hours of operation, so as time moves on from the pandemic, we anticipate PSC usage will increase as hours of operation do.

Over the past two years, the PSC was severely short-staffed with only two employees working to serve the great majority of these students while still setting and preparing labs. While the open positions were posted, the pay rate was well below a living wage and applications were not received. While we suspect low wages to be the main reason that there were no applicants, we plan to start performing exit interviews with lab staff when they resign to gain a clearer understanding of their desire to leave. Additionally, some work with HR has resulted in large enough wage increases that two new lab assistants have been hired during the Summer 2022. While these wage increases are much appreciated, there are still equity questions regarding compensation for lab assistants in the SEM division vs. those in the Health Professions division, which do not, to our knowledge, require any special trainings or certifications. Our current pay range for these positions is $29,000-$31,000 (with an associate degree) at the competitive rate.

Physics and engineering students also enjoy the common area of the Engineering Center, replete with group study tables, whiteboards on every wall for working problems, and staff/tutors on hand for questions and help. Fostering close-knit study groups is one of the most effective ways to retain students and boost performance.

In fall of 2020 OCCC moved to an 8-week model for course delivery. Therefore, in the fall of 2020 and the spring of 2021, all physics courses were offered only in the 8-week format. However, since that time, the Physics program has had more latitude in choosing the format of course offerings. The Physics program has opted to offer as many courses as possible in the more traditional 16-week on-campus format, consistent with student interest.

Regarding the supply budget for the program, almost all needs are currently being met by annual budget allocations, with larger, less-frequent purchases being funded by the division. However, if we create more lab space to meet demand, or as labs are modified and rewritten, we are hopeful that budget lines will increase proportionately to adequately supply those lab spaces and specialized equipment.

Physics Program-related Library Resources:

Instruction and Reference

Reference librarians (4.5 FTE) provide instruction and reference assistance to students. Students should receive an introduction to the library's resources as well as instruction on selecting and evaluating sources in the required Success in College and Life course. Additional instruction is provided to individual classes, usually with a focus on the appropriate resources for that discipline.

Librarians are available by online chat approximately 56 hours per week. Also, librarians are available in the library for in person assistance Monday-Thursday 8 AM to 9 PM and Friday 8 AM to 5 PM. Additionally, students may contact librarians via email or the library website for research assistance. Video tutorials and online LibGuides on the library's website supplement instruction by providing guidance for students who are off campus.

Print and Electronic Resources

The Science Engineering and Mathematics librarian selects and purchases science and biological related materials. Items are evaluated for content and to ensure they are appropriate for college freshman and sophomores. Most book purchases are based on reviews in Choice, and related scholarly journal reviews. Recommendations by faculty are also encouraged. The collection is weeded periodically to maintain currency. Ebooks are purchased. The pandemic caused a shift in ebook usage; prior to the pandemic ebooks were not heavily used by students.

Although course textbooks are available at the library Circulation Desk for in-library use, most students use the Day One access to their textbooks. Even so, there are students still using the Reserve collection.

Print periodicals for physics have been eliminated in favor of electronic access. The *Masterfile Premier*, Academic Search Premier and other databases available via *EBSCOhost* are a substantial source of relevant mass market periodicals and full text, peer-reviewed scholarly physics journals.

Academic Video Online, PBS, and *Films on Demand*, collections of academic and scholarly videos, are utilized by faculty teaching online courses as well as in the on-campus classrooms. Over 1000 videos related to the field of physics are available in *Academic Video Online*. *PBS* has close to 100 videos related to physics, and *Films on Demand* has almost 500 videos related to the science of physics.

The library also strives to support the professional development of faculty. The circulating book collection is updated with books on teaching, learning, technology in the classroom and curriculum development. Additionally, the library has the *Education Source* database (available via *EBSCOhost*) to provide faculty access to periodical literature on teaching and andragogy.

During the pandemic closure and subsequent reduction in hours, library staff worked to ensure access to resources and services by mailing books to students, extending due dates, providing curbside book pickup, increasing online chat coverage, creating additional instructional videos, providing online access to course reserves and additional electronic databases, offering Zoom reference meetings with students, and laptop and webcam checkout. A wireless hotspot checkout service was added in Fall 2021.

Facility

The library offers public computers, group study rooms, digital scanners, free printing (100 pages per semester, per student), huddle stations, mobile white boards, laptop and hotspot checkout, and a designated/monitored quiet study area.

In Fall, 2022, the library installed individual use cubicles (Study Cubbies) in the designated quiet study area. Study Cubbies are reservable by all OCCC students, faculty, and staff.

In summary, the library supports this program and the faculty comprehensively and appropriately.

Recommendation(s)

A. **Recommendation for the Program (3.7.7.A.4):**

- ☒ Maintain the program at the current level.
- ☐ Continue the program with modifications as noted below and detailed in the comment section below.
  - ☐ Expand the program
  - ☐ Reduce program in size or scope
  - ☐ Merge or consolidate program
  - ☐ Reorganize program/curricular modifications*
- ☐ Suspend program to allow an opportunity to consider recommendations detailed in the section below*
- ☐ Delete program*

**Requires a Request for Degree Program Modification and governing board approval.*

B. Specific comments regarding recommendations:

(Provide detailed recommendations for the program as a result of this thorough review and how these recommendations will be implemented, as well as the timeline for key elements. Recommendations to suspend or modify the program should include measurable goals and a timeline for monitoring the program in one-, two-, three-, or four-year increments)

Recommendations	Implementation Plan	Target Date
Hire 1-2 more full-time faculty positions to address student demand.	In the absence of an official mechanism for requesting a new faculty member at OCCC, the program chair and faculty will simply be vigilant in their efforts to advocate for the additional of a full-time faculty member whenever given the opportunity..	Ideally, Fall 2023 or until accomplished. With schools budgets fluctuating every year, it will be unclear if/when funds will be available to add a full-time faculty position.
Find ways to include Physics artifacts for general education assessment.	This will have to be implemented after discussions with the Physics faculty and the General Education team to prove relevance to the multiple Gen Ed assessment categories.	By next program review.
Increase communication with Alumni	Explore ways to increase engagement with alumni. Find ways to use alumni to help strengthen the program.	By next program review.

Add additional rows as necessary

Department/
Program Head _____ Date: Click here to enter a date.
(Signature)

Dean _____ Date: Click here to enter a date.
(Signature)

Chief
Academic
Officer _____ Date: Click here to enter a date.
(Signature)

President _____ Date: Click here to enter a date.
(Signature)