Program Review Executive Summary Template

Based on the thorough program review addressing all criteria in policy, a comprehensive report should be possible within ten or fewer pages. This template is provided to assist institutions in providing a brief summary, which is to be presented to the institutional governing board prior to submission to the State Regents. Executive summaries should be possible within two pages using this template format.

Institution Name: Rose State College
Program Name and State Regents Code: 0112 Physics
List Any Options:
Date of Review: October 2017 **Recommended Date of Next Review:** 2022

Centrality to Institutional Mission:
The Physics Program serves the Mission of Rose State College (RSC) by providing a diverse group of students with University Transfer Education, Continuing Education, and various experimental /laboratory opportunities.

Program Objectives and Goals:
Upon completion the graduate will be prepared to:

1. Apply knowledge of fundamental mathematics, science, and engineering.
2. Apply critical thinking and scientific methodologies to various scientific applications and theories
3. Communicate effectively within the discipline content
4. Successfully pursue study in a scientific, mathematics, engineering, or technological area at a baccalaureate institution
5. Identify, formulate, and solve various levels and capacities of physics problems

Quality Indicators Such As:	
– **Student Learning Outcomes** – **Effective Teaching** – **Effective Learning Environments** – **External Curricular Evaluation** – **Capacity to Meet Needs and Expectations of Constituencies**	• Students are consistently evaluated in effective communication and quantitative reasoning • Average enrollment for PHYS classes is 15.3 • Students have access to tutoring and help sessions • Course content is routinely evaluated for compatibility to transfer institutions The Physics Program strives to provide quality, comprehensive lower division courses along with related laboratory work and opportunities which will transfer to the receiving college or university and allow the student to pursue a baccalaureate degree. The Physics Program services many other programs and

	student majors by meeting general education science requirements, both at Rose State College and other colleges and universities
Productivity for Most Recent 5 Years	**Number of Degrees:** 2013: 3, 2014: 2, 2015: 1, 2016: 2, 2017: 2 **Number of Majors:** 2013: 15, 2014: 18, 2015: 15, 2016: 16, 2017: 17

Other Quantitative Measures Such As:
– **Number of Courses for Major**
– **Student Credit Hour in Major**
– **Direct Instructional Costs**
– **Supporting Credit Hour Production**
– **Roster of faculty members including the number of FTE faculty in the specialized courses within the curriculum**
– **If available, information about employment or advanced studies of graduates of the program over the past five years**
– **If available, information about the success of students from this program who have transferred to another institution**
	• During the current evaluation period:
	  ○ Nine different physics courses were taught
	  ○ An average of 38 sections per year were offered
	  ○ An average of 67 credit hours were generated per year
	• Faculty Roster:
	  ○ James Gilbert; Professor & Coordinator, M.S. Physics
	  ○ Mahmoud Radfar" Professor, MS Physics
	  ○ Adjunct Faculty as needed
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Duplication and Demand	• No other programs in the Midwest City/ Del City area offer college level physics courses • Physics majors at RSC has increased 6.3% since 2013
Effective Use of Resources	• Increased and stable enrollments and credit hour production without significant increase in expenditures or FTE's
Strengths and Weaknesses	***Strengths:*** Transfer agreements and working relationships with multiple Universities. The program has well qualified instructors who have broad teaching insights and backgrounds as well as research experience within the discipline. Classes are over-sized so instructors and students can interface easily. Laboratories, laboratory equipment, and classroom materials are well maintained and a full-time physics laboratory support specialist is highly utilized and an invaluable asset to the Physics Program. The program's academic curriculum is diverse and solid and prepares students for future studies. Rose State College is a low cost alternative for a variety of students and is accessible within a wide area. The physics program has implemented honors components in student coursework and laboratory work and research. Physics students have been recipients of the *Outstanding Honors Project* at Rose State College several times. And received recognition at State Competitions. The program's academic curriculum is diverse and solid and prepares students for future studies. Rose State College is a low cost alternative for a variety of students and is accessible within a wide area.

	Weaknesses: Lack in consistency of qualified upper-level students to employ and serve within tutorial capacities. Industry demands for bachelor's degree as minimum requirement for most physics related employment opportunities. Laboratory equipment is often stretched thin as to accommodate the many laboratory sections required each term. Student Advisement is too often out of the Engineering & Science Division. Limited equipment budgets
Recommendations	Continue to supplement student-related research projects and additional coursework Support the increase size of Physics Program faculty as needed. Increasing marketing and recruitment efforts for prospective students. Directly engaging current students to encourage and support retention. Maintaining close working relationships with 4-year institutions to ensure course transferability. Closely measuring future program success by continuously reviewing the number of majors and graduates. Actively engaging with industry and government to ensure program viability, to take advantage of collaboration benefits, and to provide opportunities for student scholarships and internships.

	Analyze and procure current computer related programs, software, and hardware, and to integrate them into lectures, laboratories, homework, and research activities as appropriate. Improve technology associated with all physics courses Institute distance learning of lower level physics courses Increased equipment budgets

Program Review Summary Template
3.7 Academic Program Review
(optional)

Based on the thorough internal or external program review addressing all criteria in policy, a comprehensive report should be possible within ten or fewer pages. This program review 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. Executive Summaries should be possible within two pages using the provided template (Program Review Executive Summary Template).

Description of the program's connection to the institutional mission and goals:

The Physics Department has the goal and objective of providing wide-ranging lower division courses and A.S. degree which are compatible and transferable to degree programs at 4-year colleges and universities. Course handouts and information by all faculties provide students with the necessary information about the courses and their policies. Courses are designed to support and service existing degree programs within Rose State College and also provide necessary coverage and content required for student continuation. Our courses are maintained at levels commensurate with 4-year schools.

3.7.5 Process (Internal/External Review):
Previous Reviews and Actions from those reviews:

Analysis and Assessment (including quantitative and qualitative measures) noting key findings from internal or external reviews and including developments since the last review:

The faculty develops, reviews, and updates curriculum for the physics program and courses as appropriate. Every full time physics faculty adheres to consistent assessment (testing) and laboratory standards to assure the students are learning course material at a level commensurate with other institutions of higher learning.

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

The Physics Program provides students with access to quality instruction by well qualified faculty so that students can complete their associate degree and/or transfer to a four year program with the necessary content to pursue and achieve their goals.

B. Vitality of the Program:

B.1.Program Objectives and Goals:

The Associate in Science in Physics Degree Program provides students with the analytical skills and scientific knowledge to expand and apply critical thinking to all facets of learning. The expected Program outcome is to provide a comprehensive lower-division education for students who plan to transfer to a baccalaureate degree program in the S.T.E.M. areas.

The Physics Program is a fundamental academic program and is an important component of Rose State College. Improvements in curriculum, course offerings, and laboratory equipment are pursued continuously. New courses and laboratory experiments are being added, modified, and updated as the science/technology or college mission requires. The students in this program are generally non-typical full-time students, so their progress through the program is slow, resulting in a lower graduation rates compared to more traditional parallel programs.

B.2 Quality Indicators (including Higher Learning Commission issues):

- Students are consistently evaluated in effective communication and quantitative reasoning
- Average course size is 15.3 students.
- Classrooms and Laboratories are modern and well equipped as appropriate.
- Students have access to tutoring and help sessions
- Modern Physics for Engineers (capstone course) is a very prevalent course.
- Course equivalencies are regularly confirmed for transfer to other institutions (via participation in the Course Equivalency Project of the Oklahoma Regents for Higher Education).

Student Outcomes

The physics Program evaluates student outcomes in a number of ways. Students are required to present their findings and conclusions in both written and oral formats at various points in the curriculum. In these presentations, students must be able to identify and gather knowledge that is applicable to the situation, use an appropriate critical thinking methodology to formulate a solution, and communicate their findings in a professional manner. Additionally, RSC evaluates the quantitative reasoning and effective writing skills of the student body on a college wide basis by surveying randomly selected classes.

Effective Teaching

Both full time and adjunct physics faculty consistently evaluated by students, peer faculty, and administration. The performance ratings for faculty from all three evaluating groups are consistently high.

RSC students have access to tutoring through the Learning Resource Center, and assistance with math and chemistry questions is readily available through the RSC Math Lab. Additionally, Professors are available to answer questions from all physics classes during office hours or via appointment along with a Laboratory Support Specialist available to assist when

and where appropriate Finally, RSC provides many excellent workshops for students and faculty designed to enhance professional and personal development within many capacities.

External Curricular Evaluation

The content of courses in the EP are regularly evaluated by the engineering programs at The University of Oklahoma, The University of Central Oklahoma, and Oklahoma State University.

Capacity to Meet Needs of Students

The Engineering and Science Division at RSC employs an academic advisor to serve all of its students including those enrolled in the Physics Program.

B.3. Minimum Productivity Indicators:

Time Frame (e.g.: 5 year span)	Head Count (majors)	Graduates (A.S.)
2013	15	3
2014	18	2
2015	15	1
2016	16	2
2017	17	2

B.4. Other Quantitative Measures:

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

All physics courses are taught exclusively for all S.T.E.M. majors. Course routinely offered are as follows:

PHYS 1513 Introduction to Physics
PHYS 1253 Introduction to Musical Acoustics and Sound
PHYS 2401 General Physics Lab. I
PHYS 2411 General Physics Lab II
PHYS 2414 General Physics I
PHYS 2424 General; Physics II
PHYS 2434 Physics I for Engineering & Science Majors
PHYS 2444 Physics I for Engineering & Science Majors
PHYS 2943 Modern Physics for Engineers

The physics program directly supports and services other program and course requirements in our division as needed (e.g. Chemistry, Engineering, & Mathematics).

b. Student credit hours by level generated in all major courses that make up the degree program for five years:

Number of Courses Taught		Number of Enrollments		Number of Credit Hrs offered	
2013	34	2013	526	2013	68
2014	36	2014	574	2014	67
2015	37	2015	518	2015	68
2016	39	2016	623	2016	65
2017	44	2017	674	2017	65

c. Direct instructional costs for the program for the review period (annual):

Travel	0
Equipment	$3,500
Supplies	$1,000
Full-Time Faculty	$138,035
Adjunct Faculty	$ 57,483
Total	$200,018

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

Number of Courses Taught		Number of Enrollments		Number of Credit Hrs	
2013	13	2013	343	2013	39
2014	12	2014	360	2014	36
2015	13	2015	311	2015	39
2016	12	2016	382	2016	36
2017	12	2017	373	2017	36

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	Institution that granted degree
James Gilbert	M.S., Physics	University of Minnesota
Mahmoud Radfar	M.S., Engineering Physics	University of Central Oklahoma
adjunct faculty	M.S. or higher	varies

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

Records show that 36 students transferred to another institution to continue their studies with 18 graduated. However, information and student data regarding employment and/or college program continuation is not available and/or incomplete. An Associates of Science degree in physics would generally be utilized for a student to transfer into an advanced degree program, and not necessarily directly into the workforce.

g. If available, information about the success of students from this program who have transferred to another institution:

Records show that 71% of students transferred to another institution to continue their studies with 50% graduated. However, information and student data regarding continuation is not available, incomplete, or mis-le3ading due to some students taking courses while currently enrolled in other institutions.

B.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 publics 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.

B.5. Duplication and Demand Issues:

Address Duplication:

There are no duplicate programs in the RSC area or adjoining communities.

Demand for physics courses are either steady or increasing, while demand for the major remains steady and appropriate for two-year programs.

B.5.a. Detail demand from students, taking into account the profiles of applicants, enrollment, completion data, and occupational data:

The demand for the physics degree has been relatively steady over the years. Also, demand for support programs remains steady and increasing. However, the enrollment in physics courses has been significantly increasing due to requirements for supporting programs (mainly Engineering) in the recent years.

B.5.b. Detail demand for students produced by the program, taking into account employer demands, demands for skills of graduates, and job placement data:

The US Bureau of Labor Statistics reports an expected steady demand for S.T.E.M. graduates. This will include the demand for physics graduates, and graduates in programs which rely heavily upon physics material and courses (e.g. Engineering, Chemistry, Mathematics, etc.).

B.5.c. Detail demand for services or intellectual property of the program, including demands in the form of grants, contracts, or consulting:

Intellectual property is not an outcome of the program.

B.5.d. Detail indirect demands in the form of faculty and student contributions to the cultural life and well-being of the community:

- Faculty regularly serve as judges for community science fairs and visit local schools at all grade levels. This expands and promotes relationships of the S.T.E.M. faculty with the local schools and introduces potential new students to R.S.C. programs.
- Increasing marketing and recruitment efforts for prospective students are pursued
- Directly engaging current students to encourage and support retention
- Maintaining close working relationships with 4-year institutions to ensure course transferability
- Actively engaging with industry and government to ensure program viability, to take advantage of collaboration benefits and opportunities.
- Analyze and procure current computer related programs, software, and hardware, and to integrate them into lectures, laboratories, homework, and research activities as appropriate.
- Improve technology associated with all physics courses
- Institute distance learning of lower level physics courses

B.5.e. The process of program review should address meeting demands for the program through alternative forms of delivery. Detail how the program has met these demands:

All physics courses are taught within the traditional manner at college level with the appropriate offered laboratory courses to accompany them. Course information and content, power point presentations, etc. are offered on the D2L learning platform. A newly develop on-line Introductory Physics course is being offered. The Modern Physics course has been offered as a hybrid course the last few years.

B.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.

Multiple physical and computer/multimedia demonstrations for learning and lecture related support are utilized on a regular basis. A newly created on-line introductory physics course soon to be implemented. Laboratory courses utilize and the needed equipment and materials to perform the required and necessary student related physics laboratory work. The Physics laboratory lecture and classroom have been renovated and upgraded via the 21 million dollar capital RSC capital improvements. Also, a new campus student center is its initial planning phase.

*Low Producing Program Reviews follow a different format and template.

Institutional Program Recommendations: (describe 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	Implementation Plan	Target Date
Physics Program as part of the College's mission	Strategic Planning	As deemed by College
Addition of a full or part time faculty member to share and assist the physics program in laboratory courses and lectures.	As allowed by RSC budgets and employment availability	FALL 2018
Increasing marketing and recruitment efforts for prospective students	Continuation in any way appropriately possible	Current
Directly engaging current students to encourage and support retention	Continuation in any way appropriately possible	Current
Maintaining close working relationships with 4-year institutions to ensure course transferability	Continuation in any way appropriately possible	Current

Engage with industry and government to ensure program viability, as to take advantage of collaboration benefits.	Continuation in any way appropriately possible	Current
Analyze and procure current computer related programs, software, and hardware, as to integrate and implement them into physics lectures, laboratories, homework, and student related research activities as appropriate.	Continuation as allowed by program budget and vendor availability	Current
Improve technology and laboratory equipment associated with all physics lecture and laboratory courses	Continuation allowed by Physics Program and E & S Division budgets	Current
Institute distance learning of lower level physics courses	In progress	SP 18

Summary of Recommendations:

	Department	School/College	Institutional
Possible Recommendations:	Physics	Rose State College	Division of Engineering & Science
Expand program (# of students)	Continuation		
Maintain program at current level	Continuation		
Reduce program in size or scope			
Reorganize program			
Suspend program			
Delete program			

Department/
Program Head _____ (Signature) Date 10-31-17

Dean _____ (Signature) Date 10/31/17