Physics Program Review 2016-17

Closing MOU **September 29, 2017**

Overview

Degree/Certificate Programs Reviewed:	Physics, Bachelor of Science Physics, Master of Science Physics, Dr. of Philosophy
Department Chair & Dean:	Paul Neill, Chair; Jeff Thompson, Dean
External Reviewers & Affiliation:	Dr. Thad Walker, Professor, Department of Physics, University of Wisconsin-Madison Dr. Robert Cauble, Director, Jupiter Laser Facility, Lawrence Livermore National Laboratory Dr. Kevin D. Perry, Chair, Dept. of Atmospheric Sciences, University of Utah
Date of External Visit:	April 6-7, 2017

Review Process Summary

The physics programs were scheduled for regular program review as mandated by the Board of Regents and University policy. A self-study document for the department and its programs was developed by the department faculty and completed in Spring 2017. The report was provided to three reviewers before they conducted an on-campus visit on March 9-10, 2017. The external reviewers reviewed the programs and met with relevant faculty, staff, students and administrators to determine the department's accomplishments, examine strengths and weaknesses, and identify opportunities as its plans for the future. A final report was issued by the site visitors shortly after the review visit. In accordance with institution practice, responses to the review were solicited from the department and the dean. A final meeting of all parties took place on September 21, 2017. This documents represents the final MOU of recommendations and findings from the review.

Signatures

Executive Vice President & Provost: _____ Date: 10/2/17

Vice Provost, Undergraduate Education: _____ Date: 10/3/17

Major Findings and Conclusions

1. The UNR Department of Physics has very productive faculty in terms of grants, publications, and students being graduated at both the undergrad and grad level.
2. The department has effectively handled a large increase in enrollment without an increase in instructional personnel.
3. The department is responsive to student needs in terms of academic advising and placement, and has a supportive departmental atmosphere.
4. There is a very high level of student satisfaction at both undergrad and grad levels, with high quality advising and faculty access.
5. Involvement of undergraduate students in research is excellent. The senior research project requirement is highly meritorious.
6. All courses are taught by individuals with a Ph.D.
7. The department respects its instructors and treats them well.

Next Steps for this Program/Department

1. In consultation with the Dean of the Graduate School, the department should work to improve recruitment of high quality graduate students. The department should utilize support offered by the Graduate School and consider implementing a recruiting weekend event. The recently implemented earlier application deadlines (from March 1 in the past) are an improvement, and the department should consider moving them even earlier as appropriate in relation to national norms in the field. (This may be as early as January 1-15.)

2. The department should evaluate how to expand the ATMS undergraduate curriculum to satisfy the Office of Personnel Management requirements for employment as a professional meteorologist (Meteorology Series 1340). It is understood that mathematics requirements of the courses may need to be made more rigorous.

3. The Physics Chair should work with the Dean of the Graduate School to facilitate collaboration between ATMS faculty at UNR and DRI (and other faculty at UNR). Joint appointments are an option to consider. The chair should complete an MOU that confirms commitments from DRI to current ATMS faculty at UNR.

4. A review of best practices for advanced undergraduate class sizes and modes of instruction at peer and aspirant institutions, as well as at other science departments at UNR should occur. It is acknowledged that the use of graders and GTA-led recitation sections may be advantageous to undergraduate pedagogy, and that GTA experience may increase the employment competitiveness of graduate students.

5. The department should consult with the CCID program on strategies to improve training in scientific writing and communication, and to explore new ways to integrate writing into the undergraduate and graduate curriculum.

6. A review of the rigor of introductory and more advanced undergraduate physics courses should also occur. The department should address discontinuities in difficulty and consider the introduction of intermediate, problems-based elements to the undergraduate curriculum.

7. The department should also review the breadth of graduate course selections at peer/aspirant institutions and then respond with a proposal for augmented course offerings if a deficiency is identified.

8. A review of the level of rigor in instruction and textbook selection in core graduate courses taught by different individual faculty (e.g. E&M) should occur. Faculty should have a consensus on a set of acceptable textbooks and assessments needed to assure that SLOs are being met.

9. The purpose of the comprehensive exam should be clarified. Physics faculty should arrive at a consensus on whether to retain it or replace it with a qualifying exam.

10. Central administration acknowledges, despite two recent positions newly assigned to the Physics Department, that additional strategic hires would strengthen the department and that a strong physics program is central to UNR's R1 goals. The Space Physics cluster proposal is recognized as meritorious and there is opportunity build upon the strength in AMO physics. The department is encouraged to submit proposals to the dean in response to future RFP solicitations for new positions.

11. Central administration acknowledges that competitive startup packages are required to attract top faculty. When new positions are proposed, faculty should contact peer institutions to evaluate the startup funding levels needed to construct competitive offers. That information should be included in proposals that are in response to future RFP solicitations for new positions.

12. In response to the concerns identified during the external review visit, the provost has provided resources to stabilize the NTF. Central administration acknowledges that additional resources are needed over the longer term. The VPRI will evaluate the feasibility of a larger fraction of NTF F&A being returned to the NTF.

13. The department needs to confirm for research faculty that they have role statements that are aligned with their position descriptions and are the basis for merit review.

14. Institutional funding proposals among HEDP research faculty should be coordinated in order to be successful.

15. Central administration encourages the department to request needed administrative support positions in response to future RFP solicitations.

16. Central administration acknowledges that science faculty, and especially junior faculty, should be consulted with regard to implementation of UNR's High Performance Computing (HPC) initiative.

17. The department should review project wait times and the job scheduling system in the physics machine shop to assure junior faculty receive high priority. A recharge system to improve throughput and efficiency should be examined. It is acknowledged that startup costs could increase if recharge were implemented.

18. Central administration acknowledges that future renovation of the first floor of the Physics Building will be required as the department grows. The existing renovation plan should be reviewed holistically.

19. All colleges have been directed to ensure that formal mentoring plans and programs for junior faculty are in place by next fall. The dean has directed all College of Science chairs to prepare a formal mentoring plan for incorporation in the college's plan. This plan should address not only assistant professors on the tenure track but also associate professors who should seek promotion to full professor.

Vital Statistics on NSHE Reports

Physics, B.S.

Number of students with declared major in the program area:	233
Number of graduates from the program, 2014-15:	14
Number of graduates from the program, 2015-16:	18
Number of graduates from the program, 2016-17:	20
Headcount of students enrolled in any course related to the program (duplicated):	6549

Physics, M.S.

Number of students with declared major in the program area:	9
Number of graduates from the program, 2014-15:	6
Number of graduates from the program, 2015-16:	1
Number of graduates from the program, 2016-17:	4
Headcount of students enrolled in any course related to the program (duplicated):	74

Physics, Ph.D.

Number of students with declared major in the program area:	26
Number of graduates from the program, 2014-15:	8
Number of graduates from the program, 2015-16:	4
Number of graduates from the program, 2016-17:	4
Headcount of students enrolled in any course related to the program (duplicated):	203