



## Program Assessment Report (PAR)

Intrdisciplnry App Science+Math (IASM) Doctoral Degree

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**ACADEMIC YEAR COVERED BY THIS REPORT:** 2021-2022

### I. PROGRAM LEARNING OUTCOMES

1. Graduates will have a mastery of knowledge appropriate to their course of study in core courses, advanced courses, and from the scientific literature.
2. Graduates will have a robust scientific background in their respective interdisciplinary area of research spanning some of the following focus area disciplines - physics, mathematics and statistics, environmental sciences, psychology, biology, chemistry, business, and economics.
3. Students will be proficient in manuscript and grant preparation.
4. Students will be introduced to employment opportunities at local businesses through internship courses.
5. The student will process analytical skills to create informed solutions. They will be capable to define relevant scientific problems, formulate hypotheses, design and carry out experiments, and interpret scientific data.

### II. PROCEDURES USED FOR ASSESSMENT

#### A. Direct Assessment

1. Student mastery of knowledge is assessed via their academic performance in core program courses (Scientific Computation and Mathematical Modeling). These courses are designed to give IASM PhD candidates robust footing in analysis of data generated in their interdisciplinary research. Their performance will be further monitored through a series of upper-level courses aimed at enhancing their knowledge base in a specific research area. Students will be assessed through 3 qualification examination. One will cover the material of Scientific Computation and Mathematical Modeling courses. The other two will be on the material of area specific coursework.
2. Graduates' mastery of scientific background will be assessed through a combination of Candidacy Examination, PhD thesis and defense, exit interview, and a series of evaluations filled in by the dissertation committee during Candidacy and PhD thesis examinations.

3. Graduates' proficiency in manuscript and grant preparation will be gauged through an IASM course – Research and Career Development, where students are taught the foundation of scientific writing and grant preparation. In addition, dissertation committee will quantitatively evaluate the quality of graduate's scholarly work, which will be used to quantify student's performance.
4. Students' performance during their internship at local businesses will be assessed through an evaluation filled in by their immediate internship supervisor.
5. Students' scientific and analytical abilities will be gauged by the dissertation committee as a part of evaluation during their Candidacy Exam and PhD defense.

## **B. Scoring of Student Work**

Graduates' performance will be gauged via a combination of grades (assigned by instructors), qualification examinations (assigned by respective course instructors), a range of evaluations following a set of rubrics (completed by the dissertation committee and supervisors). Course and examination grades will be used as a metric of student's performance. The evaluations will be quantified via a rubric by the program director.

## **C. Indirect Assessment**

Graduates' will have an opportunity to provide the evaluation of IASM program and their perceived progress towards program's learning outcomes through a set of and exit interview questionnaire.

## **III. ASSESSMENT RESULTS/INFORMATION:**

[AssessmentResult]

Direct assesment:

Outcome 1. Three students have completed the core program courses. Two of them have successfully passed the qualifying exams based on the core coursesat level adequate for a PhD candidate. One student have not passed the qualifying exam and have since decided to leave the program.

Outcome 2. One student have successfully passed the Candidacy exam, three students have been awarded a PhD degree.

Outcome 3. Two students have demonstrated competency in manuscript and grant preparation in "Research and Career Development" course.

The disseration committee have rated the most recent graduates as Proficient and

Exemplary (data attached)

Outcome 4. No internship reports were received during this period.

Outcome 5. The analytical abilities of recent graduates were rated as Proficient and Exemplary.

[Analysis]

#### **IV. ACTIONS TO IMPROVE STUDENT LEARNING**

The most recent data were shared with program faculty

#### **V. SUPPORTING DOCUMENTS**

Additional documentation, when provided, is stored in the internal Academic Program Assessment of Student Learning SharePoint site.