Stevens Institute of Technology

School of Business

**AACSB**
**ASSURANCE OF LEARNING PLAN**

Learning Goal Assessment Guide

**Doctor of Philosophy in Financial Engineering**

**(Ph.D.)**

**LEARNING GOAL # 2**

**Ph.D. graduates will have sufficiently mastered the core knowledge and tools needed to conduct original research in a timely manner.**

**Responsibility: Zhenyu Cui**

May 2022

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1. Learning Goal Assessment Guide

This guide documents the assessment process for Goal 2 of the three learning goals in the Ph.D. program. The assessment process is conducted in accordance of the Assurance of Learning (AoL) plan for the Ph.D. program.

1. Learning Goals

The Learning Goals for the Ph.D. program are listed below.

* Ph.D. graduates can effectively communicate research in oral presentations.
* Ph.D. graduates will have sufficiently mastered the core knowledge and tools needed to conduct original research in a timely manner.
* Ph.D. graduates are able to effectively deliver academic courses in a university environment.
1. Learning Goal Introduction

This guide covers Learning Goal 2 for the Ph.D. program:

* Ph.D. graduates will have sufficiently mastered the core knowledge and tools needed to conduct original research in a timely manner.

**This goal is assessed at the end of every academic year**. This goal requires students to publish peer reviewed articles in their respective research field.

**There is one primary method of assessment:** Eachstudent has to submit a progress and activity report at the end of every academic year.The assessment reviews the submitted activity reports.

**To complete this requirement successfully, students need to** have mastered the core knowledge and research tools in their field of study and they have defended their dissertation in a timely manner.

1. Learning Objectives and Traits

The following table shows the objectives and traits to assess goal 2 of the Ph.D. program.

The goal is to ensure that students will have the skills necessary to complete high-quality, original dissertations within 4 years of full-time study (the maximum allowed time span to finish a dissertation is 6 years). There is not a specific timeline when the students should finish their proposal but a delay of a proposal correlates highly with a delay of the dissertation defense and extends the doctoral studies.

The first objective is that the students are able to write competitive research papers of publication quality. The second objective is that students will successfully defend their dissertation before the end of 6 years of full-time study.

Appendix C contains a copy of the “Doctoral Activity Report,” which is administered annually and is used to collect data relevant to the assessment of Ph.D. goal 2. Appendices B, D and E contain the template used to gather information for the assessment of this goal.

**Table 5: PhD Learning Goal 2, Objectives and Rubrics**

|  |  |
| --- | --- |
| **PhD - 2** | **Learning Goal, Objectives and Traits** |
| **GOAL** | Ph.D. graduates will have sufficiently mastered the core knowledge and tools needed to conduct original research in a timely manner. |
| **Objective 1:** | *Students are able to write competitive, original research papers* |
| Trait 1: | Satisfactory research papers as evaluated by the examining committee submitted as part of the qualifying examinations |
| Trait 2: | Number of papers presented and/or published in academic outlets |
| **Objective 2:** | *Students will defend their dissertations at or about the end of the sixth year of full-time study.* |
| Trait 1: | Elapsed time to proposal defense |
| Trait 2: | Elapsed time to dissertation defense |

1. Rubrics

|  |  |
| --- | --- |
| **Objective 1** | *Students are able to write competitive research papers.* |
|   | **Trait** | **Poor** | **Good** | **Excellent** | **Score** |
|   | **Value** |  |  |  |  |
| Trait 1: | Satisfactory research papers as evaluated by the examining committee submitted as part of the qualifying examinations \* (see rubric below) |  |  |  |   |
|  | **Does not meet expectations: 0; Meets: 1; Exceeds: 2** |   |   |   |   |
|  |  |
|   |  | **Poor** | **Good** | **Excellent** | **Score** |
|   | **Value** |  |  |  |  |
| Trait 2: | Number of papers presented and/or published in academic outlets |  |  |  |   |
| **Total:** | **Does not meet expectations: 0-1; Meets: 2; Exceeds: 3** |   |   |   |   |

**Rubric: PHD2-Objective 1 – Trait 1**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **EVALUATION****CRITERIA** | **0** | **1** | **2** | **3** | **4** |
| **Originality and novelty** | The work completely lacks originality | Repeats work of others with only minor changes | Work has not been done before, but is an obvious extension of previous work | Work incrementally improves on previous approaches | Work is cleverly designed and/or represents a significantly new direction or approach |
| **Advances the State of the Art** | No advance is evident | Results are obvious or easily anticipated | Incrementally advanced the knowledge in the field | Significantly advanced the knowledge in the field | Greatly advanced the knowledge in the field |
| **Literature survey** | Lacking | Cursory | Extensive but either not complete or not critical | Complete and concise, but not adequately critical | Comprehensive and critical |
| **Uses new or advanced techniques** | Uses only primitive methods | Uses only simple and long-established methods and techniques | Uses standard methods commonly known in the field | Uses the most advanced established methods | Uses or develops leading-edge methods not applied before in this field  |
| **Has elements of theory** | Does not involve any theoretical development or predictions | Incorporates standard theory in the field | Incrementally advances theory currently used in the field | Significantly extends existing theory in the field | Involves theory that represents a break with the state-of-the-art |
| **Has empirical elements** | There is no data collection or usage | Few data are collected or relies on data from others | Data collection is a minor part of this work | Data collection is a major part of this work | Employs sophisticated and novel empirical methods |
| **Written presentation (Paper)** | Missing significant details or very difficult to read | Disorganized or lacking in some details | All details are present, but requires some effort by reader | All details are present, organization is adequate | Comprehensive, elegantly and clearly written |

|  |  |
| --- | --- |
| **Objective 2** | *Students will defend their dissertations at or about the end of the sixth year of fulltime study.* |
|   | **Trait** | **Poor** | **Good** | **Excellent** | **Score** |
|   | **Value** |  |  |  |  |
| Trait 1 | Elapsed time to proposal defense. |  |  |  |   |
|  | **Does not meet expectations: >3 years; Meets: 3 years; Exceeds: less than 3 years** |   |   |   |   |
|  |  |  |  |  |  |
|  |  | **Poor** | **Good** | **Excellent** | **Score** |
|   | **Value** |  |  |  |  |
| Trait 2 | Elapsed time to dissertation defense. |  |  |  |   |
| **Total:** | **Does not meet expectations: Does not meet expectations: >6 years; Meets: 6 years; Exceeds: less than 4 years** |   |   |   |   |

1. Assessment Process

All Ph.D. students will be assessed every semester.

|  |  |  |  |
| --- | --- | --- | --- |
| **PhD LEARNING GOAL 2** | **Where and when measured?** | **How measured?** | **Criterion** |
| 2. Ph.D. graduates will have sufficiently mastered the core knowledge and tools needed to conduct original research in a timely manner.  | To graduate each student is required to:1. publish one peer reviewed article2. submit one article to a peer reviewed journal.Every semester | Sampling: All PhD students.Activity report. | All students (100%) have to publish at least one article in a peer reviewed journal. |

Every student has to submit at the end of every semester an activity report (see appendix). This report is the basis for the collection of the necessary data.

1. Results of Learning Goal Assessment

The results of the initial learning goal assessments carried out to date are included below.

**Explanation**

The learning goal #2 has one learning objective and is measured using the rubric “the number of publications”.

The assessment is conducted by classifying students into the three categories:

- Does not meet expectations
- Meets expectations
- Exceeds expectations

The person doing the assessment provides explanatory comments and recommendations on the bottom of the Results Summary Sheet. The recommendations improve content or policies of the program.

1. Results of Assessment: SPRING 2022

**LEARNING GOAL # 2: Our Ph.D. graduates master the core knowledge and research tools in their major field of study.**

**LEARNING OBJECTIVE # 1: Students are able to write competitive research papers.**

**ASSESSMENT DATE: May 25, 2022 ASSESSOR: Zhenyu Cui**

**NO. OF STUDENTS TESTED: 19**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **FT/ PT** | **Years in Program** | **PRJ** | **Procs** | **Bk Chap** | **Books** | **(Working** |
| **Papers)** |
| **Yunfan Zhu** | **FT** | 4 | **2** | **0** | 0 | 0 | **2** |
| **Stavros Tsarpalis** | **FT** | 5.5 | **0** | **0** | 0 | 0 | **1** |
| **Zhaokun Cai** | **FT** | 5 | **0** | **0** | 0 | 0 | **3** |
| **Mingzhe Liu** | **FT** | 5 | **2** | **0** | 0 | 0 | **2** |
| **Jeffrey Mo** | **FT** | 4.5 | **2** | **1** | 0 | 0 | **2** |
| **Dongxu Li** | **FT** | 2 | **0** | **0** | 0 | 0 | **0** |
| **Harsha, Soloman** | **PT** | 6.5 | **1** | **0** | 0 | 0 | 0 |
| **Li, Xugong (Bill)** | **PT** | 7.5 | **0** | **1** | 0 | 0 | 2 |
| **Gurvich, Alex** | **PT** | 7.5 | **1** | **1** | 0 | 0 | 2 |
| **Zhao, Zhe** | **PT** | 6.5 | **2** | **0** | 0 | 0 | 2 |
| **Yang Li**  | **FT** | 3 | **0** | **0** | 0 | 0 | 1 |
| **Zequn Li** | **FT** | 3 | **0** | **0** | 0 | 0 | 1 |
| **Zhiyu Cao** | **FT** | 3 | **0** | **0** | 0 | 0 | 0 |
| **Lu Chen** | **FT** | 3 | **0** | **0** | 0 | 0 | 1 |
| **William Long** | **FT** | 3 | **0** | **0** | 0 | 0 | 1 |
| **Zhiyang Deng** | **FT** | 2 | **0** | **0** | 0 | 0 | 0 |
| **Jingyi Wei** | **FT** | 1 | **0** | **0** | 0 | 0 | 0 |
| **Ruijing Yang** | **FT** | 2 | **0** | **0** | 0 | 0 | 0 |
| **Agathe Sadeghi** | **FT** | 2 | **0** | **0** | 0 | 0 | 0 |
| **Total** | **19** |   | **10** | **3** | **0** | **0** | **20** |

|  |  |
| --- | --- |
| **Objective 1** | *Students are able to write competitive research papers.* |
|   | **Trait** | **Poor** | **Good** | **Excellent** | **Score** |
| Trait 1: | Number of publications at graduation. | **0** | **3** | **>6** |  |
| **Criterion:** | **Does not meet expectations: 0-1; Meets: 2; Exceeds: 3** |   |   |   |  N.A. |

**COMMENTS:** There are 3 students graduated in the 2021-2022 academic year. Some students just finished their first year and do not have a publication. Among those graduated, all met the expectation. They all had 2 journal papers by graduation. The journals include Journal of Futures Market, Statistics and Probability Letters, Operations Research Letters, etc.

**REMEDIAL ACTIONS:** For the coming year, shall encourage students to focus on writing more working papers to build up the pipeline.

**LEARNING OBJECTIVE # 2: Students will defend their dissertations at or about the end of the sixth year of fulltime study.**

**ASSESSMENT DATE: May 25, 2022 ASSESSOR: Zhenyu Cui**

**NO. OF STUDENTS TESTED: 3**

Table 4

|  |  |
| --- | --- |
| **Objective 2** | *Students will defend their dissertations at or about the end of the sixth year of fulltime study.* |
|   | **Trait** | **Poor** | **Good** | **Excellent** | **Score** |
| Trait 1 | Elapsed time to proposal defense. | **0** | **3** | **0** |   |
| **Total:** | **Does not meet expectations: >3 years; Meets: 3 years; Exceeds: less than 3 years** | **0** | **3** | **0** |   |
|  |  |  |  |  |  |
|  | **Value** | **Poor** | **Good** | **Excellent** | **Score** |
|   |  |  |  |  |  |
| Trait 2 | Elapsed time to dissertation defense. | **1** | **1** | **1** |   |
| **Total:** | **Does not meet expectations: Does not meet expectations: >6 years; Meets: 6 years; Exceeds: less than 4 years** | **1** | **1** | **1** |   |

**REMEDIAL ACTIONS:** There are three students who took more than 6 years to defend their dissertations, and two of them are part-time students**.** Other 6 students assessed all graduated within 6 years. We currently still have 6 students who were admitted into the program before the AOL learning goals were instituted. We will have to treat them with the legacy policy, but we will try to push them to meet the new requirements.

1. Specific Steps Taken in Spring 2022

No specific actions taken in terms of the Learning Goal #2 during this assessment period.

1. CLOSE LOOP PROCESS – CONTINUOUS IMPROVEMENT RECORD

**Close Loop Process - Continuous Improvement Record Goal 2**

**Program:** Ph.D. in Financial Engineering

**Goal 2:** Ph.D. graduates will have sufficiently mastered the core knowledge and tools needed to conduct original research in a timely manner.

**Goal Owner:** Zhenyu Cui

**Where Measured:** At the end of the academic year on the program level.

**How Measured:** **Sampling:** Students have to submit a progress and activity report at the end of every semester.

**Description:** Students finishing their third year should have some academic publications leading toward their dissertation defenses.

|  |  |
| --- | --- |
| **Objective 1** | *Students will be able to publish on high impact academic journals.* |
| **When Assessed:** | **At the end of the 2020 spring semester** |
| **Remedial****Action** | Communicate the publication expectations and recommended journals to individual PhD advisors. |
| **Outcome from previous assessment:** | N/A |

APPENDIX TARGET JOURNAL LIST

Quantitative Finance/Mathematical Finance

1. Mathematical Finance (ABS3)

2. Quantitative Finance (ABS3)

3. Finance and Stochastics (ABS3)

4. SIAM Journal on Financial Mathematics (ABS2)

5. Applied Mathematical Finance (ABS2)

6. International Journal of Theoretical and Applied Finance (ABS2)

7. Journal of Computational Finance (ABS1)

8. Journal of Financial Engineering

Finance/Economics Journals Accepting Quantitative Approaches

??Journal of Finance (FT50/ABS4\*) - A pure finance journal

??Journal of Financial Economics (FT50/ABS4\*) - A pure finance journal

??The Review of Financial Studies (FT50/ABS4\*) - A pure finance journal

??Journal of Financial and Quantitative Analysis (FT50/ABS4\*) - A pure finance journal

??Econometrica (FT50/ABS4\*) - A pure economics journal

1. Journal of Econometrics (ABS4)

2. Journal of Financial Markets (ABS3)

3. Journal of Banking and Finance (ABS3)

4. Journal of Financial Econometrics (ABS3)

5. Journal of Futures Markets (ABS3)

6. Journal of Financial Stability (ABS 3)

7. Journal of Economic Behavior and Organization (ABS3)

8. Journal of Economic Dynamics and Control (ABS3)

9. Journal of Derivatives (ABS2)

10. Journal of Portfolio Management (ABS2)

11. Finance Research Letters (ABS2)

12. Asia-Pacific Financial Markets (ABS2)

13. Annals of Finance (ABS2)

14. Journal of Risk (ABS2)

15. Journal of Derivatives and Hedge Funds (ABS 2)

16. Economics and Finance Research (ABS 1)

17. Journal of Network Theory in Finance

Quantitative Journals Accepting Finance/Economics Applications

??Operations Research (FT50/ABS4\*) - Focused on broad methods

??Management Science (FT50/ABS4\*) - A pure finance journal

??Annals of Statistics (ABS4\*) - A pure economics journal

1. European Journal of Operational Research (ABS4)

2. Decision Sciences (ABS3)

3. Annals of Operations Research (ABS3)

4. SIAM Journal on Optimization (ABS3)

5. IEEE Transactions on Systems, Man, and Cybernetics: Systems (ABS3)

6. Journal of the Operational Research Society (ABS3)

7. Decision Support Systems (ABS3)

8. Expert Systems with Applications (ABS3)

9. Neurocomputing (ABS3)

10. Computational Optimization and Applications (ABS 3)

11. International Journal of Forecasting (ABS 3)

12. Journal of Forecasting (ABS 2)

13. Expert Systems: the Journal of Knowledge Engineering (ABS 2)

14. Systems Research and Behavioral Science (ABS 2)

15. Simulation Modeling Practice and Theory (ABS 2)

16. Physica A (ABS 2)

17. Statistics and Risk Modeling

18. Monte Carlo Methods and Applications

19. Complexity (IF4)

20. High Frequency

APPENDIX Research Paper Review

**School of Business**

**TEMPLATES OF AACSB Ph.D. LEARNING GOAL 2 ASSESSMENT**

**PROGRAM: PhD Program**

**PhD-2 GOAL: Ph.D. graduates will have sufficiently mastered the core knowledge and tools needed to conduct original research in a timely manner.**

**LEARNING OBJECTIVE #1: Students are able to write competitive, original research papers.**

**Trait # 1: Satisfactory research papers as evaluated by the examining committee submitted as part of the qualifying examinations.**

**ASSESSMENT DATE: ASSESSOR:**

**QUALIFYING EXAMINATION:**

**Candidate: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Examination Committee Members: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **EVALUATION****CRITERIA** | **0** | **1** | **2** | **3** | **4** |
| **Originality and novelty** | The work completely lacks originality | Repeats work of others with only minor changes | Work has not been done before, but is an obvious extension of previous work | Work incrementally improves on previous approaches | Work is cleverly designed and/or represents a significantly new direction or approach |
| **Advances the State of the Art** | No advance is evident | Results are obvious or easily anticipated | Incrementally advanced the knowledge in the field | Significantly advanced the knowledge in the field | Greatly advanced the knowledge in the field |
| **Literature survey** | Lacking | Cursory | Extensive but either not complete or not critical | Complete and concise, but not adequately critical | Comprehensive and critical |
| **Uses new or advanced techniques** | Uses only primitive methods | Uses only simple and long-established methods and techniques | Uses standard methods commonly known in the field | Uses the most advanced established methods | Uses or develops leading-edge methods not applied before in this field  |
| **Has elements of theory** | Does not involve any theoretical development or predictions | Incorporates standard theory in the field | Incrementally advances theory currently used in the field | Significantly extends existing theory in the field | Involves theory that represents a break with the state-of-the-art |
| **Has empirical elements** | There is no data collection or usage | Few data are collected or relies on data from others | Data collection is a minor part of this work | Data collection is a major part of this work | Employs sophisticated and novel empirical methods |
| **Written presentation (Paper)** | Missing significant details or very difficult to read | Disorganized or lacking in some details | All details are present, but requires some effort by reader | All details are present, organization is adequate | Comprehensive, elegantly and clearly written |

APPENDIX – Activity Report

|  |  |
| --- | --- |
| official-logo-clear-bkg | Stevens Institute of TechnologyCastle Point on HudsonHoboken, NJ 07030-5991 |

**School of Business Doctoral Activity Report**

|  |  |
| --- | --- |
| Student Name:  | Advisor Name:  |
| Student Identification No.: \_\_\_\_\_\_-\_\_\_\_-\_\_\_\_\_\_\_\_ |  |
| Major/Concentration:  |  |

AREA OF DOCTORAL RESEARCH/ WORKING TITLE OF DISSERTATION:

Activity for: Fall Spring Summer 20 \_\_\_\_

Please list your learning and research activities of the current semester, include preparations for research papers and conferences, passed exams, meetings with the Dissertation Advisory Committee etc.:

|  |  |  |
| --- | --- | --- |
| Courses taken this period | Grade |  |
|  |  |  |
|  |  |  |
|  |  |  |
| Qualifying Exams: |  |  |  |  |
| Dissertation: | Proposal | Defense |  |
| Papers: | Working Papers | Conference | Proceedings | Journal |
| Research Plan for next semester: |  |
| Overall Self-Evaluation(Satisfied with progress) |  |

Other comments:

Please list your learning and research objectives for the coming semester: include preparations for research papers and conferences, exams etc.:

Please attach your updated CV

STUDENT SIGNATURE DATE

|  |  |  |
| --- | --- | --- |
| Advisor Evaluation: | Satisfactory | Unsatisfactory |

ADVISOR SIGNATURE DATE

(OVER)

INSTRUCTIONS

TO THE STUDENT:

Please list in the activity report all learning and research activities.

1. Which courses have you finished?
2. Have you passed any exams?
3. Have you started to work on your dissertation topic? What have you accomplished?
4. Have you prepared a conference paper or a journal article? To which conference or journal have you submitted?
5. What are your learning and research objectives for the coming semester? Which courses do you plan to take? Do you plan to write a research paper? Do you plan to finish your dissertation proposal?
6. Have you met with members of your dissertation advisory committee?
7. If you have the status of “doctoral candidate” you need to fill out the DAR (Doctoral Activity Report) form. Please use your progress report as the basis for the DAR.
8. Please sign your report and discuss it with your advisor.

TO THE RESEARCH ADVISOR:

Please discuss the activity report with your advisee.

1. Please specify with the student the objectives for the next semester.
2. Please co-sign the report and give a final evaluation.
3. If your advisee has the status of doctoral candidate please sign the Doctoral Activity Report form.
4. Please submit the progress report and if applicable the DAR to the Howe School Ph.D. program director.
5. You will be invited to a review meeting with the Ph.D. program committee.