

TO: Kathy Pollock, Chair, Senate Executive Committee
FROM: Carol Lawton, Chair, Curriculum Review Subcommittee *Carol A. Lawton*
DATE: December 3, 2018
SUBJECT: Proposals for Actuarial Science Minor and Behavior Analysis & Techniques
Certificate

Curriculum Review Subcommittee members support the proposal from the Department of Mathematical Sciences for a Minor in Actuarial Science. Members also support the proposal from the Department of Psychology for a Certificate in Behavior Analysis and Techniques. We find that the proposals (attached) require no Senate review.

Approving

Swathi Baddam
Seth Green
Carol Lawton
Vincent Maloney
Sue Skekloff
Jin Soung Yoo
Julia Smith
Kate White

PFW
Request for a New Minor

Proposed Title of Minor: Minor in Actuarial Science

Department Offering the Minor: Mathematical Sciences

Projected Date of Implementation: Fall 2019

- I. Why is this minor needed? (Rationale)
With the launch of BS in Actuarial Science program at PFW in Fall 2017 there is significant interest from Business School Departments and their students.
- II. List the major topics and curriculum of the minor.
 - *Two Calculus Course sequence (MA 165/166 or MA 229/230);*
 - *Coursework leading to two actuarial exams;*
 - *Coursework required for one Validation by Educational Experience;*
 - *Grade of C- or higher for all courses required in the minor;*
 - *GPA of 2.3 or higher in all courses included in your minor;*
 - *No more than one grade as low as C- will be accepted in this minor.*
- III. What are the admission requirements?
Submit Application for Minor with the Department of Mathematical Sciences.
- IV. Describe student population to be served.
Students in various business, engineering, math, or sciences programs.
- V. How does this minor complement the campus or departmental mission?
Allows students in other programs to pursue course work in actuarial sciences.
- VI. Describe any relationship to existing programs within the university.
Since 2017 the department delivers BS in Actuarial Sciences.
- VII. List and indicate the resources required to implement the proposed minor. Indicate sources (e.g., reallocations or any new resources such as personnel, library holdings, equipment, etc.). *
No additional personnel is required, some additional library resources.
- VIII. A Liaison Library Memo
- IX. Describe any innovative features of the program (e.g., involvement with local or regional agencies, or offices, cooperative efforts with other institutions, etc.).
Allows accounting/economics majors to gain actuarial sciences knowledge applicable to careers in the insurance industry, extends support for strong local insurance industry.

*The library resource questionnaire available at:
<http://www.ipfw.edu/offices/oaa/programs/curriculumdev.html>

To: COAS Curriculum Committee
From: Department of Mathematical Sciences
Date: October 11, 2018
Subject: Minor in Actuarial Science

Background:

The Department of Mathematical Sciences has received inquiries regarding a Minor in Actuarial Science. We have modeled the proposed minor (found at the bottom of this page) on the actuarial science major. The current B.S. in Actuarial Sciences has coursework leading to three exams of the Society of Actuaries (FM, P, MFE) and three Validation by Educational Experience (VEE) topics (Economics, Accounting and Finance, and Statistics).

The courses leading to the three exams of Society of Actuaries currently include:

- Exam FM – MA 27300 Intro. to Financial Mathematics (3 cr., C: Calculus II, MA 166 or MA 230);
- Exam P – STAT 51600 Basic Probability Applications (3 cr., P: MA 261);
- Exam MFE – MA 49000 Models of Financial Economics (4 cr., P: MA 27300, BUS 30100).

The courses for the three required VEE topics include:

- VEE in Economics – ECON 20101 Intro. to Microeconomics (3 cr.) and ECON 20201 Intro. to Macroeconomics (3 cr.);
- VEE in Accounting and Finance – BUS 20100 Intro. to Financial Accounting (3 cr.) and BUS 30100 Financial Management (3 cr.);
- VEE in Mathematical Statistics – STAT 51700 Statistical Inference (3 cr.).

Proposal for Minor in Actuarial Science:

The Department of Mathematical Sciences recommends that the 2019-20 Undergraduate Bulletin reflect the following requirements for the Minor in Actuarial Science.

Program Requirements:

- You must complete a two Calculus Course sequence (MA 165/166 or MA 229/230);
- You must complete coursework leading to two actuarial exams;
- You must complete coursework required for one Validation by Educational Experience;
- You must earn a grade of C- or higher for all courses required in the minor;
- You must have a GPA of 2.3 or higher in all courses included in your minor;
- No more than one grade as low as C- will be accepted in this minor.

Samples:

A sample Actuarial Minor for Business:

MA 22900, MA 23000, MA 27300, MA 49000 – MFE, ECON 20101, ECON 20201

A sample Actuarial Minor for Engineering, Math, or Sciences:

MA 16500, MA 16600, MA 26100, MA 27300, STAT 51600, STAT 51700

Liaison Librarian Memo

Date:

From:

To:

Re:

Describe availability of library resources to support proposed new program:

Comments:

Liaison Librarian Signature

Date

When developing a new degree program, major, certificate, minor, concentration, track, or specialization please review the questions below when developing your response to the library or additional resources sections. Please consult your liaison librarian for assistance.

Library Resources: [Minor in Actuarial Science](#)

Address the following issues regarding the impact of the new program on the library's budget and personnel. Please respond to each item below indicating the library sources and services required to support the proposed program.

- Which databases/indexing sources will be used by the courses in this program? [None](#).
- What are the journals that will be used by students completing library research in this program? [None](#). Please list three to five titles. Is there an expectation that access to new journals will need to be purchased for students in this program? [No](#).
- Are there any specific reference sources (e.g. encyclopedias, handbooks, standards, etc.) required to support the new program? [No](#).
- Is there an expectation for additional books to be purchased? [Reference texts recommended by the Society of Actuaries for examination preparation. \(List is attached.\)](#) What about DVD or audio/visual materials? [None planned at this time](#). What is the estimated dollar amount needed yearly to support this program with new books and media materials? [\\$800](#).
- Will the new program use the Library's Document Delivery Services? [No](#). Costs for this service come out of the Library's budget. What types of materials would the program be requesting through DDS? [None](#).
- Who is the liaison librarian for this program? [Shannon Johnson](#) The liaison librarian provides support through involvement in Blackboard-supported classes, one-on-one research consultations, in-class instructional sessions, and tailored course guides for research assignments. Which of these librarian services do you anticipate will be utilized in the new program? [None](#).
- Memo from Liaison Librarian regarding resources.
- Is there an accrediting body that will be overseeing this program? [No](#). What are the statements of the accrediting body related to the library, e.g. holdings, personnel, services? [None](#).

Source: Society of Actuaries website soa.org

Preparation for Society of Actuaries Exams

Suggested Textbooks:

(FM) Exam:

Broverman, S.A., *Mathematics of Investment and Credit (Seventh Edition)*, 2017, ACTEX Publications, ISBN 978-1-63588-221-6

Daniel, J.W., and Vaaler, L.J.F., *Mathematical Interest Theory (Second Edition)*, 2009, The Mathematical Association of America, ISBN: 978-0883857540.

Kellison, S.G., *The Theory of Interest (Third Edition)*, 2009, Irwin/McGraw-Hill, ISBN: 125921544X or 978-1259215445

Francis, J. and Ruckman, C., *Interest Theory – Financial Mathematics and Deterministic Valuation; (Second Edition)*, 2018, ActuarialBrew, ISBN 978-0998160412 Chan, Wai-Sum, and Tse, Yiu-Kuen,

Financial Mathematics for Actuaries, Second Edition, 2018, World Scientific Publishing Company, ISBN: 978-9813224667 (hard cover) or 978-9813224674 (paperback).

Probability (P) Exam:

A First Course in Probability (Ninth Edition), 2012, by Ross, S.M., Pearson/Prentice Hall, ISBN: 978-0321794772

Mathematical Statistics with Applications (Seventh Edition), 2008, by Wackerly, D., Mendenhall III, W., Scheaffer, R., Thomson Brooks/Cole ISBN: 978-0495110811

Probability for Risk Management, (Second Edition), 2006, by Hassett, M. and Stewart, D., ACTEX, ISBN: 978-156698-2

Probability and Statistical Inference (Ninth Edition), 2014, by Hogg, R.V., Tanis, E.A., and D. Zimmerman, Prentice Hall, ISBN: 978-0321923271

Probability and Statistics with Applications: A Problem Solving Text, (Second Edition) 2015, by Asimow, L. and Maxwell, M., ACTEX, ISBN: 978-1-62542-472-3

Investments and Financial Markets (IFM) Exam:

Derivatives Markets (Third Edition), 2013, by McDonald, R.L., Pearson Education, ISBN: 978-0-32154-308-0

Corporate Finance (Fourth Edition), 2017, by Berk, J. and DeMarzo, P., Pearson, ISBN: 978-0-13408-327-8.

Statistics for Risk Modeling (SRM) Exam:

Regression Modeling with Actuarial and Financial Applications, Edward W. Frees, 2010, New York: Cambridge. ISBN: 978-0521135962.

An Introduction to Statistical Learning, with Applications in R, James, Witten, Hastie, Tibshirani, 2013, New York: Springer.

Predictive Analytics (PA) Exam:

Regression Modeling with Actuarial and Financial Applications, Edward W. Frees, 2010, New York: Cambridge. ISBN: 978-0521135962.

An Introduction to Statistical Learning, with Applications in R, James, Witten, Hastie, Tibshirani, 2013, New York: Springer.

R for Everyone, 2nd ed. Lander, 2017, Boston: Addison-Wesley, ISBN 978-0-13-454692-6.

Data Visualization: A Practical Introduction, Healy, 2018, Princeton University Press.

Long-Term Actuarial Mathematics (LTAM) Exam:

Actuarial Mathematics for Life Contingent Risks, 2nd Edition, 2013, Dickson, D., Hardy, M., Waters, H., Cambridge University Press, ISBN: 978-1-10704-407-4.

Short-Term Actuarial Mathematics (STAM) Exam:

Loss Models: From Data to Decisions, (Fourth Edition), 2012, by Klugman, S.A., Panjer, H.H. and Willmot, G.E., Wiley, ISBN: 978-1-118-31532-3

Additional Recommendations from our faculty:

The Elements of Statistical Learning: Data Mining, Inference, and Prediction (Springer Series in Statistics) by Trevor Hastie, Robert Tibshirani, Jerome Friedman ISBN 978-0387952840

Introductory Statistics with R, by Peter Dalgaard

The Art of R Programming, by Norman Matloff

Linear Models with R, Second Edition, by Julian J. Faraway

R Cookbook, by Paul Teetor

Request for a New Credit Certificate Program

Campus: Purdue University Fort Wayne

Proposed Title of Certificate Program: Behavior Analysis and Techniques

Projected Date of Implementation: Fall 2019

TYPE OF CERTIFICATE: (check one)

UNDERGRADUATE CERTIFICATES – These programs generally require 12-29 credits of undergraduate-level academic work.

GRADUATE CERTIFICATES – These programs generally require 12-29 credits of graduate-level academic work or undergraduate academic work carrying graduate credit.

POST-BACCALAUREATE CERTIFICATES – These programs generally require 12-29 credits of undergraduate-level academic work, although students enrolling in these programs must have completed their baccalaureate degrees.

I. Why is this certificate needed? (Rationale)

This program will prepare students to sit for the Registered Behavior Technician (RBT) exam of the Behavior Analyst Certification Board. An RBT is a paraprofessional who works under supervision of a Board Certified Behavior Analyst to implement intervention or assessment plans for individuals with behavioral problems, such as children with autism. Our program will provide coursework on the topics covered on the RBT exam, as well as the hours of supervised fieldwork required to sit for the exam. Students who complete the program will have an advantage in obtaining jobs as behavior technicians because they will have the required hours of fieldwork that would otherwise need to be completed on the job. Job growth through 2026 for behavioral disorder and substance abuse counselors in Indiana is projected to be very strong (4 on a 5-point scale; <http://www.hoosierdata.in.gov/FD/landing.aspx>) and there are many autism and community mental health centers in our surrounding area that hire behavior technicians.

II. List the major topics and curriculum of the certificate.

The curriculum of the certificate is intended to cover topics on the RBT exam and to provide the hours of fieldwork that are required to sit for the RBT exam.

PSY 12000-Elementary Psychology (3 cr)

PSY 23500-Child Development or PSY 36900-Lifespan Development (3 cr.; P PSY 12000)

PSY 31400-Learning (3 cr.; P PSY 12000)

PSY 35000-Abnormal Psychology (3 cr)

PSY 53200-Disorders of Childhood (3 cr.; P PSY 23500 or 36900, and PSY 35000)

PSY 39200-Issues and Fieldwork in Applied Behavior Analysis (3 cr). This class will introduce students to the field of Applied Behavior Analysis (ABA) and will examine how behavioral theory and the experimental analysis of behavior can be applied to

real-world issues. The course will cover measurement, assessment, skill acquisition, behavior reduction, documentation and reporting, and professional conduct and scope of practice as they relate to the practice of Applied Behavior Analysis. Students also will complete a practicum experience at an area agency that offers ABA-based interventions to clients in the community.

III. What are the admission requirements?

Minimum GPA of 2.0.

IV. List the major student outcomes (or set of performance based standards) for the proposed certificate.

- Acquisition of knowledge about human development, principles of behavior change, behavioral disorders, and ethical issues related to the field of behavior analysis.
- Application of behavioral intervention skills in a supervised setting where such services are provided.
- Preparation for employment as a behavior technician and to sit for the RBT exam.

V. Explain how student learning outcomes will be assessed (student portfolios, graduate follow up, employer survey, standardized test, etc.) and describe the structure/process for reviewing assessment findings for the purpose of ensuring continuous improvement of the certificate.

- Scores on relevant portions of the Major Field Test in Psychology.
- Survey of supervisors of the field experience required in the program.
- Survey of graduates on employment attained after graduation.
- Pass rate on the RBT exam, if available.

Results from these measures will be reviewed every three years by the department, and used to improve the program as needed.

VI. Describe student population to be served.

Students most likely to be interested in this certificate program will be Purdue Fort Wayne students who are Psychology majors and minors, and Human Services majors.

VII. How does this certificate complement the campus or departmental mission?

This certificate is consistent with the department's mission to provide students with a strong foundation in the scientific understanding of human behavior and mental processes, and with preparation for careers related to the field. The certificate is also consistent with the campus mission and vision in providing access to "programs that drive the intellectual, social, economic, and cultural advancement of our students and our region" and being known for "graduates prepared to improve the quality of life in their communities as well as compete locally, regionally, and globally."

VIII. Describe any relationship to existing programs on the campus or within the university.

There are no related existing programs on campus. Purdue Global offers a B.S. in Psychology-Applied Behavior Analysis.

- IX. List and indicate the resources required to implement the proposed program. Indicate sources (e.g., reallocations or any new resources such as personnel, library holdings, equipment, etc.)

The library allows full-text access to relevant journals, including Behavior Analysis, Behavior Analysis Digest, Journal of Applied Behavior Analysis, Behavior Analysis in Practice, and Behavior Modification. Five additional books not currently in library holdings are being requested.

- X. A Liaison Library Memo

(memo will be attached).

- XI. Describe any innovative features of the program (e.g., involvement with local or regional agencies, or offices, cooperative efforts with other institutions, etc.

The program will develop relationships with community agencies that serve as sites for the practicum experience in behavioral intervention services. These relationships are expected to facilitate job prospects for our graduates.

Library Resources for Behavior Analysis & Techniques Certificate Program, Psychology Department

Address the following issues regarding the impact of the new program on the library's budget and personnel. Please respond to each item below indicating the library sources and services required to support the proposed program.

1. Which databases/indexing sources will be used by the courses in this program?
PsycInfo

2. What are the journals that will be used by students completing library research in this program? Please list three to five titles. Is there an expectation that access to new journals will need to be purchased for students in this program?
 - Behavior Analysis
 - Behavior Analysis Digest
 - Journal of Applied Behavior Analysis
 - Behavior Analysis in Practice
 - Behavior Modification

3. Are there any specific reference sources (e.g. encyclopedias, handbooks, standards, etc.) required to support the new program?
Bailey & Burch - Ethics for Applied Behavior Analysts - ISBN-13: 978-1138949201, ISBN-10: 9781138949201
 - Applied Behavior Analysis (3rd Edition) May 10, 2019 by John O. Cooper and Timothy E. Heron (available for pre-order now) ISBN-13: 978-0134752556 ISBN-10: 0134752554
 - Functional Assessment and Program Development for Problem Behavior: A Practical Handbook 3rd Edition by Robert E. O'Neill (Author), Richard W. Albin (Author), Keith Storey (Author), Robert H. Horner (Author), Jeffrey R. Sprague (Author) ISBN-13: 978-1285734828 ISBN-10: 9781285734828
 - Handbook of Applied Behavior Analysis by Wayne W. Fisher (Editor), Cathleen C. Piazza (Editor), Henry S. Roane (Editor) ISBN-13: 978-1462513383 ISBN-10: 9781462513383
 - Training Manual for Behavior Technicians Working with Individuals with Autism 1st Edition by Jonathan Tarbox (Author), Courtney Tarbox (Author) ISBN-13: 978-0128094082 ISBN-10: 0128094087

4. Is there an expectation for additional books to be purchased? What about DVD or audio/visual materials? What is the estimated dollar amount needed yearly to support this program with new books and media materials?
 - Applied Behavior Analysis by Edward P. Sarafino, ISBN: 9780470571521, 2012

5. Will the new program use the Library's Document Delivery Services? Costs for this service come out of the Library's budget. What types of materials would the program be requesting through DDS?
Yes; occasional journal articles.

6. Who is the liaison librarian for this program? The liaison librarian provides support through involvement in Blackboard-supported classes, one-on-one research consultations, in-class instructional sessions, and tailored course guides for research assignments. Which of these librarian services do you anticipate will be utilized in the new program?
Liaison librarian: Sue Skekloff; helping students with literature searches.

7. Memo from Liaison Librarian regarding resources.

8. Is there an accrediting body that will be overseeing this program? What are the statements of the accrediting body related to the library, e.g. holdings, personnel, services?
No accrediting body overseeing the program.

Liaison Librarian Memo

Date: October 24, 2018

From: Sue Skekloff

To: Carol Lawton

Re: Library Resources for Proposed Behavior Analysis & Techniques Certificate Program

Describe availability of library resources to support proposed new program:

The Library already subscribes to PsycInfo and the journals listed on the checklist which will support the new program. We certainly have the funds to purchase the six book titles needed from our monograph budget. I see nothing on the checklist which would prevent the library from supporting this program at its inception. New subscriptions which may be needed in the future may have to be funded by an increase in the library's budget.

Comments:

Liaison Librarian Signature

Sue Skekloff, Associate Librarian

Date

October 24, 2018