APPLICATION FOR FACULTY RESEARCH GRANT

**All questions must be completed to be considered for grant award.**

Choose one: [ ] Creative Research  [ ] Research

Date of Last FRG Award (Semester and Year awarded): ______________________________

Date of ATU Faculty Appointment (Semester and Year): Fall 2001

1. Project Title: Research in Actuarial Mathematics

2. Name of Principal Investigator/Project Director: Dr. Marcel B. Finan


5. Campus Mail Address: Corley 244  6. PI/PD Campus Phone: 964-0854

7. Amount Requested: $2,000  8. Total Cost of Project: $6,000 - $8,000

9. Does this project involve: [ ] human subjects?  [ ] animals/animal care facility?
   [ ] radioactive materials?  [ ] hazardous materials?
   [ ] biological agents or toxins restricted by the USA Patriot Act?
   [ ] copyright or patent potential?
   [ ] utilization of space not currently available to the PI/PD?
   [ ] the purchase of equipment/instrumentation/software currently available to the PI/PD?

NOTE: If the answer is "yes" to any of the above questions, the investigator must attach appropriate documentation of approval or justification for use/purchase.

SIGNATURES

Department Contribution (if applicable): $________
Account Number: ____________________________  Chairperson: ________
Date: ________

School Contribution (if applicable): $________
Account Number: ____________________________  Dean: ________
Date: ________

This Section to be completed by the Office of Academic Affairs

FSBA Committee Award Recommendation: Yes  No
FSBA Committee Proposal Rank: ___ of ___ Total Proposals.
Recommendation of VPAA: Yes  No
Recommendation of President: Yes  No
Award Date: 12/5/07
PROPOSED BUDGET
FACULTY RESEARCH/DEVELOPMENT GRANT
(include budget categories as appropriate)

1. Graduate assistant stipend
   Fringe benefits: salary x .0012
   ________
   $ 500

2. Non-work study stipend
   Fringe benefits: salary x .0012
   ________
   ________

3. *Supplies (please list items to be purchased and estimated price per item including taxes and shipping, if appropriate):

<table>
<thead>
<tr>
<th>Item No. 1 (e.g., software)</th>
<th>Estimated Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No. 2 (e.g., copying costs)</td>
<td>Estimated Price</td>
</tr>
<tr>
<td>Item No. 3 (Books)</td>
<td>Estimated Price</td>
</tr>
</tbody>
</table>

(additional lines as needed)

Total estimated supplies

$400

4. Travel (please list travel expenditures by date and estimated costs):

<table>
<thead>
<tr>
<th>Travel No. 1</th>
<th>Estimated Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel No. 2</td>
<td>Estimated Price</td>
</tr>
<tr>
<td>Travel No. 3</td>
<td>Estimated Price</td>
</tr>
</tbody>
</table>

(additional lines as needed)

Total estimated travel

$1,100

5. *Capital Outlay (please list items to be purchased and estimated price per item including taxes and shipping, if appropriate):

<table>
<thead>
<tr>
<th>Item No. 1</th>
<th>Estimated Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item No. 2</td>
<td>Estimated Price</td>
</tr>
<tr>
<td>Item No. 3</td>
<td>Estimated Price</td>
</tr>
</tbody>
</table>

(additional lines as needed)

Total estimated capital outlay

TOTAL PROPOSED BUDGET

$2,000

*Items purchased under $2,500 (including taxes and shipping) are considered supply items. Capital Outlay items are those which cost $2,500 or more (including taxes and shipping).
Arkansas Tech University
Russellville, Arkansas

Faculty Research Grant Submission

Title of Project
Research in Actuarial Mathematics

Project Director: Marcel B. Finan
Date Submitted: 01/15/2007
School of Systems Science
Department of Mathematics
Research in Actuarial Mathematics

Marcel B Finan
Department of Mathematics
Arkansas Tech University
Russellville, Ar 72801

Abstract

I am requesting support for my ongoing research in the field of actuarial mathematics. The support will cover a three-year subscription in the North American Actuarial Journal, some books needed for my research, conference expenses to attend the 42 Actuarial Research Conference in Pittsburg, and a stipend for an undergraduate student assisting with the research. The student will complete a Special Problem in Mathematics course under my supervision, and his grade for the course will be based on his performance in this research. At the completion of this research project, the student will take the first exam given by the Casualty of Actuarial Society.

The first phase of the project consists of authoring a manuscript in Probability Theory preparing students to successfully take the first exam offered by the Society of Actuaries or the Casualty Actuarial Society. Also, this manuscript will be used in MATH 4163 as a topic in Applied Mathematics. I am hopeful that the students for such a class will not be limited to just math majors but also include students majoring in Economics, Business, and Computer and Information Technology.

Actuarial programs do not exist in the State of Arkansas. My goals from the research project are to introduce our students to the field of actuarial sciences, add strength to our programs, and also provide additional job opportunities for our graduates.
1 A Brief Information on Actuarial Mathematics

Actuarial Science is the subject at the interface of mathematics and business relating to the assessment of areas involving risk management such as insurance and credit card processing. Actuaries find employment in the insurance industry, as professionals and consultants employed to certify the financial soundness of pension and insurance plans; and in government agencies such as the Social Security Administration, Pension Benefit Guaranty Corporation, and Department of Housing and Urban Development.

The training of Actuaries involves mathematical undergraduate coursework, as well as a solid grounding in business and economics. Actuarial certification issued by the Society of Actuaries (SA) or the Casualty Actuarial Society (CAS), is accomplished through a series of ETS-type examinations with a prescribed syllabus, which for the first several examinations consist primarily of mathematical finance and probability theory.

Nature of the Work
One of the main functions of actuaries is to help businesses assess the risk of certain events such as the risk for a bank or a mortgage company offering a loan to an applicant, and to formulate policies that minimize the cost of that risk. For this reason, actuaries are essential to the insurance industry. Actuaries assemble and analyze data to estimate the probability and likely cost of the occurrence of an event such as death, sickness, injury, disability, or loss of property.

Most actuaries are employed in the insurance industry, specializing in life and health insurance or property and casualty insurance. They produce probability tables which determine the likelihood that a potential future event might generate a claim. From these tables, they estimate the cost a company can expect to pay in claims. For example, property and casualty actuaries calculate the expected amount payable in claims resulting from automobile accidents; an amount that varies with the insured person's age, sex, driving history, type of car, and other factors. Actuaries ensure that the price, or premium, charged for such insurance policies will enable the company to cover claims and other expenses. The premium must be profitable,
yet competitive with other insurance companies. Within the life and health
insurance fields, actuaries help in developing long-term-care insurance and
annuity policies, the latter a growing investment tool for many individuals.

Employment
Actuaries held about 18,000 jobs in 2004, with 6 out of 10 employed in the
insurance industry. A growing number of actuaries work for firms providing
a variety of corporate services, especially management and public relations,
or for firms offering consulting services. A relatively small number of actuaries
are employed by security and commodity brokers and by government
agencies.

Earnings
Median annual earnings of actuaries were $76,340 in May 2004. The middle
50 percent earned between $54,770 and $107,650. According to the National
Association of Colleges and Employers, annual starting salaries for graduates
with a bachelors degree in actuarial science averaged $52,741 in 2005.
Insurance companies and consulting firms give merit increases to actuaries
as they gain experience and pass examinations. Some companies also offer
cash bonuses for each professional designation achieved.

2 Aims of the Project

The first phase of the proposed study consists of authoring a manuscript that
prepares students to take the first exam known as Exam P/1. Such a manu-
script will be used for a course in Applied Mathematics (MATH 4163) offered
by the Mathematics Department (MATH 4163) at Arkansas Tech University.
The manuscript will be prepared to accommodate students with background in
Mathematics, Economics, and Finance. Three more manuscripts will follow
for the next phases. Also, another goal of the study is to involve a senior
math major in this project.

References

[1] 42nd Actuarial Research Conference, August 8 - 11, Sponsored by the
Society of Actuaries and the Education and Research Section, Robert
Morris University, Moon Township, Pittsburgh.


Arkansas Tech University
Department of Mathematics

Marcel B. Finan
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Education
M.S. Mathematics, American University of Beirut, Beirut, Lebanon, Dec. 1987

Work History
Arkansas Tech University, Assistant Professor, 2001 - Present.
University of Texas at Austin, Lecturer, 1999 - 2001.
University of Texas at San Antonio, Visiting Assistant Professor, 1998 - 1999
University of North Texas, Teaching Fellow, 1992 - 1998
University of Tennessee at Knoxville, Teaching Fellow, 1988 - 1992
American University of Beirut, Teaching Assistant, 1984 - 1987

Research

Publications


**Electronic Textbooks**


Honors


Professional Activities


Professional Services

Judge for the Arkansas Junior Science and Humanities Symposium (2004 - Present)

AP Calculus Reader (2004 - 2005)


**Membership**

American Mathematical Society  
Mathematical Association of America  
Project NExT fellow (Ok-Ar Chapter)

**Computer Skills**

*Languages*: COBOL, FORTRAN, C++, HTML.  
*Platforms*: MS DOS, Unix, Linux, Windows, Sun OS.

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Last updated: December 25, 2006*
January 25, 2007

Dr. Marcel Finan
Corley 244
Arkansas Tech University
Russellville, AR 72801

Dear Dr. Finan:

Congratulations! Academic Affairs is pleased to announce your application for the Spring, 2007 Faculty Research Grant has been recommended by the Faculty Salary, Benefits, and Awards Committee. Based on this recommendation, Academic Affairs has approved the $2000.00 budget. Requisitions regarding the grant will be processed through your Dean’s office and should be expended by June 30, 2007.

Your research on this project is sure to not only benefit your department, but Arkansas Tech University as a whole. We wish you success with this endeavor.

Sincerely,

[Signature]
Jack Hannm
Vice President for Academic Affairs

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File