Graduate Certificate Proposal Form

Name of Graduate Certificate: Pharmacy Sciences

College: Medicine Department: School of Pharmacy

Contacts:

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Phone</th>
<th>e-mail address</th>
<th>Location</th>
<th>Mail Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grad Cert Dir</td>
<td>Kevin Sneed, Pharm.D.</td>
<td>813-974-5699</td>
<td><a href="mailto:ksneed@health.usf.edu">ksneed@health.usf.edu</a></td>
<td></td>
<td>MDC 13</td>
</tr>
<tr>
<td>Advisor</td>
<td></td>
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</tr>
<tr>
<td>Admin. Aast.</td>
<td>Fey Carreras</td>
<td>813-974-4465</td>
<td><a href="mailto:fcarrera@health.usf.edu">fcarrera@health.usf.edu</a></td>
<td></td>
<td>MDC 40</td>
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Academic Requirements:

Total Credit Hours Required: 12
Implementation Date: August 2009
Expected Enrollment: 20
Time Limit for Completion: 2 years

Other programs this graduate certificate links to: Doctor of Pharmacy (Pharm.D.)

Curriculum – List graduate certificate courses:

<table>
<thead>
<tr>
<th>Course number</th>
<th>Title/Credits</th>
<th>Faculty Member</th>
<th>Delivery Method</th>
<th>Required or Elective</th>
<th>Now orExisting</th>
<th>Part of another grad certificate?</th>
</tr>
</thead>
<tbody>
<tr>
<td>GMS 6141</td>
<td>Basic Medical Immunology and Microb.</td>
<td>Nick Burdash</td>
<td>online</td>
<td>Required</td>
<td>Exist</td>
<td>No</td>
</tr>
<tr>
<td>GMS 6201</td>
<td>Basic Medical Biochemistry</td>
<td>Michael J. Bartes</td>
<td>online</td>
<td>Required</td>
<td>Exist</td>
<td>Yes</td>
</tr>
<tr>
<td>GMS 6440</td>
<td>Basic Medical Physiology</td>
<td>Craig Dougnik</td>
<td>online</td>
<td>Required</td>
<td>Exist</td>
<td>No</td>
</tr>
<tr>
<td>GMS 6542</td>
<td>Basic Medical Pharmacology</td>
<td>Carlos Calligari</td>
<td>online</td>
<td>Required</td>
<td>Exist</td>
<td>No</td>
</tr>
</tbody>
</table>
Course location/delivery:
College of Medicine, Tampa campus. Fully Online

Brief Description:
See attached

Credit toward graduate degree: Up to 12 hours of certificate course credits may be applied to a graduate degree with departmental approval.

Transfer Credit: Non-degree seeking students and transfer students may apply one course to a graduate certificate with departmental approval.

Standardized tests:

Admission requirements:
Degree: A bachelor's degree or its equivalent from any accredited college, preferably in any of the biological sciences or chemistry.
GPA: A minimum undergraduate GPA of 3.0 on a 4.0 scale

Prerequisite courses (list specific courses or a certain number of credits in a discipline):

Application Process:
Official Transcripts
Resume
Letter of Interest
Other: None

Registration Process: First, consult with the certificate program advisor and obtain an electronic course permit if necessary. Then go to http://usfonline.admin.usf.edu/, the link to OASIS, USF's on-line registration system. Follow directions given on-line.
To access online course materials, students must have the USF NetID (e-mail account). Please visit: http://www acomp.usf.edu/feed.php?group=help&item=una to obtain the NetID.

New students, including those studying online, may obtain the USFCard. Please visit: http://www auxsvc.usf.edu/usfccard.html to obtain the USFCard.

Tuition and Fees: (Text for this area will be inserted based on the type of certificate selected from the drop-down list below.)
Fully online format - all course content delivered online

Financial Aid: Non-degree seeking students are not eligible for financial aid. Please contact private lenders for information on the types of student loans available.
Purpose – Describe the nature of the graduate certificate program, its primary goals, why it is needed and how it is unique:

See Attached

Benefits -- Describe how this graduate certificate will benefit students, the department, the university and the community.

See attached

Marketing/Outreach -- Describe your target market.

See attached

Competition -- List other schools where a similar program is offered and how the courses are delivered, i.e. traditional, partially online, fully online, alternative calendar, telecourse etc.:

<table>
<thead>
<tr>
<th>University</th>
<th>Location</th>
<th>Name of Grad Crt</th>
<th>Delivery Method</th>
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<tbody>
<tr>
<td>None</td>
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Funding -- On a separate sheet, detail costs associated with the start up and operation of the proposed graduate certificate (faculty, staff, equipment, space etc.). Attach a letter of resource support from your department chair/college dean to the signed proposal.

APPROVALS

<table>
<thead>
<tr>
<th>NAME</th>
<th>SIGNATURE</th>
<th>DATE</th>
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</thead>
<tbody>
<tr>
<td>Department Chair</td>
<td>Kevin Sneed, Pharm.D.</td>
<td>7/9/09</td>
</tr>
<tr>
<td>College Committee Chair</td>
<td>Patricia Kruk, Ph.D.</td>
<td>7/8/09</td>
</tr>
<tr>
<td>College Assoc. Dean</td>
<td>Michael J. Barber, D.Phil.</td>
<td>7/8/09</td>
</tr>
<tr>
<td>Graduate Council Chair</td>
<td>Jim Strange</td>
<td></td>
</tr>
<tr>
<td>Graduate Certificates</td>
<td>Karen Liller or Lagretta Lenker</td>
<td></td>
</tr>
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</table>
Graduate Certificate: Pharmacy Sciences

Purpose of the Certificate:

This graduate certificate is created for post-bachelor pre-professional students, Master's level science majors, and other advanced students who have an interest in attaining biomedical science foundations to gain additional perspective into the growing clinical nature of the pharmacy profession. Participants will extend their knowledge in the areas of biochemistry and intermediary metabolism, the physiology of the human body, microbiological and immunological activity, and the principles involved in drug action.

Academic Pharmacy institutions have created a set of standards for all accredited colleges and schools throughout the country. The student learning outcomes associated with a doctor of pharmacy (Pharm.D.) program will be a curriculum which prepares students to provide health-related services. Students will be expected to learn and achieve ability-based outcomes in both didactic and experiential courses. The Doctor of Pharmacy curricula throughout the accredited colleges and schools of pharmacy focus on a patient-centered learning model that represents the changing paradigm of pharmaceutical care throughout the country. The demand for trained pharmacy professionals has grown rapidly in recent years, related in part to the rapid growth of health care delivery systems, growth of the pharmaceutical industry, and the nation's rapidly growing elderly population. New roles are developing for pharmacists, with active involvement in drug therapy decision-making and pharmaceutical education for health-care providers and patients throughout the lifespan. Pharmacists are responsible for providing pharmaceutical care in cooperation with patients, prescribers, and other members of inter-professional health care teams. The pharmacists' activities are based upon sound therapeutic principles and evidence-based data, relevant legal, ethical, social, economic, and professional issues, emerging technologies, and evolving pharmaceutical, biomedical, socio-behavioral, and clinical sciences that may impact therapeutic outcomes.

The usual length the study for the Doctor of Pharmacy professional degree program is four years. The Doctor of Pharmacy professional degree program is anticipated to be divided into distinct pedagogical segments. The first segment is comprised of basic science foundational instruction; this includes pharmaceutical sciences, principles of pharmacology, and human anatomy and physiology-related sciences. This basic science foundation is critical in terms of pharmacy pedagogy that is required to understand the pathophysiology of humans, and the role that medicinal agents may play to treat these conditions. The next segment focuses on patient-centered learning, with more advanced pharmacology principles, and special emphasis on pharmacotherapeutics. The clinical pedagogy implemented at this time is designed to assist the development of the pharmacy clinician to provide patient care. This approach fosters integration of basic sciences, along with patient-centered learning. Substantial knowledge of the biomedical sciences will be necessary to successfully complete and excel in attaining the Doctor of Pharmacy degree.

The proposed coursework that comprises this graduate certificate is designed to augment the students' foundation of knowledge in the areas of the biomedical sciences that are necessary for a health professions curriculum. This coursework will provide a
solid platform upon which the student will build the core principles of pharmaceutical care of patients. The student will be introduced to more advanced topics including human biochemistry and metabolism, the action of microbiological and immunological systems in the body, and the principles of drug action. Students that complete this graduate certificate shall be well prepared for the basic science coursework that they will encounter during their first year in a doctor of pharmacy curriculum.

It should be noted that the University of South Florida, College of Medicine has a number of established Certificate, Master's and Ph.D. programs that focus on related subject areas. This Graduate Certificate is designed to focus on the pre-professional biomedical sciences that are most relevant for potential pharmacy applicants or students who are interested in advancing their understanding of the clinical basic sciences.

The graduate courses that comprise this graduate certificate are expected to utilize the distance or “on-line” format, which may be particularly appealing to students seeking admission into pharmacy programs around the country, not just within the state of Florida. Students enrolling in this graduate certificate may consist of potential students who are currently employed and cannot accommodate the schedules of the regular didactic courses that are offered during the traditional academic schedule. Implementation of this graduate certificate program may potentially serve as an additional recruitment effort for the future USF School of Pharmacy. This certificate may provide a valuable opportunity for post-baccalaureate students seeking to reenter a professional school of pharmacy in an effort to enter an alternate career. This may also lead to enrollment growth in other related health-care and biomedical graduate programs.

Prospective Students:

The content of the various courses that comprise the Graduate Certificate in Pharmacy Sciences has been created from the need to properly prepare students for the change in pharmacy curricula around the country from one that was basic-science oriented to one that is now patient-centered oriented. This graduate certificate program will be designed to attract the following prospective participants in this program:

1. post-baccalaureate science majors seeking an enhanced biomedical science foundation prior to entering a doctor of pharmacy program;

2. graduate students or post-baccalaureate students either currently or previously in basic-science related degree programs;

3. working professionals with science degrees seeking alternate career options and considering the profession of pharmacy as a potential career;

The on-line delivery mode of the courses will enable geographically-distant students or those currently engaged in “full-time” employment, convenient access to the selected courses and the program.
Graduates of the Pharmacy Sciences certificate will be well prepared to utilize the program’s information in a pharmacy school curriculum, and eventually in the practice of pharmacy.

**Entry Requirements:**
- A baccalaureate degree in the sciences or its equivalent from an accredited college.
- A minimum undergraduate GPA of 3.0 on a 4.0 scale.

**Course duration and mode of study:**

The Graduate Certificate in Pharmacy Sciences is designed to introduce and familiarize the participant with the major biomedical science topics that they will encounter during the initial portions of a doctor of pharmacy degree program. This will be accomplished by completing four lecture and discussion courses that are necessary to comprehend the principles of pharmaceutical care of patients in a patient-centered pharmacy curriculum, and subsequently in a health-services related career.

The component courses, hosted by the College of Medicine on the Tampa campus, will be delivered using a distance or fully “on-line” format and will make extensive use of the “Blackboard” course management environment.

The courses focus on developing participant expertise in all the major aspects of human function and systems involved in the utilization of medicinal agent’s for the purpose of treating various medical conditions. The following courses comprise the certificate:

- **Basic Medical Biochemistry:** examines biochemistry principles necessary for the understanding of the relationship between chemical and cellular mechanisms relevant to health and disease. This utilizes principles of organic chemistry and biological sciences to create the bridge to understanding the utilization of medicinal agents in the human body.

- **Basic Medical Immunology and Microbiology:** focuses on fundamental aspects of immunology and microbiology principles to clinically comprehend the function of immune response, and identify microbial organisms involved in human health and disease. It is important to understand the function of the immune system with regards to various biological pathways and inflammatory markers that may lead to, or be the result of, various pathological diseases.

- **Basic Medical Physiology:** offers an introduction to the study of the function of various human organ systems. A thorough knowledge of human physiology is necessary for pharmacy education as it relates to the implementation of pharmacotherapeutic concepts which are necessary for the application of clinical pharmacy practices for patient care.

- **Basic Medical Pharmacology:** presents an introduction to human pharmacology, focusing on concepts that examine the functioning characteristics of various drugs. An understanding of human physiology and medical biochemistry will assist the student in understanding principles of drug-receptor interaction, and the relationship to the treatment of various disease states using medicinal agents.
The Graduate Certificate will be offered as a one to two year full-time or part-time program. Students will be required to accumulate 12 credit hours by completing all of the following courses, which are directed by tenured College of Medicine faculty at the rank of Professor with extensive teaching experience, each of which represents 3 credit hours:

**Required Courses**

GMS 6141 Basic Medical Immunology and Microbiology 3 cr hrs.

*Course Director: Nick Burdash, Ph.D.*

The course focuses on the fundamental aspects of immunology and microbiology that are critical to understanding the nature of the immune response and identify the various microbiological agents that are relevant to human health and disease.

GMS 6201 Basic Medical Biochemistry 3 cr hrs.

*Course Director: Michael J. Barber, D.Phil.*

The course examines fundamental aspects of biochemistry critical to understanding the chemical and cellular mechanisms relevant to health and disease including intermediary metabolism, enzymology and storage and transfer of genetic information.

GMS 6440 Basic Medical Physiology 3 cr hrs.

*Course Director: Craig Doupnik, Ph.D.*

The course presents a concise introduction to the study of human physiology from a perspective of the function of various human organ systems with an emphasis on understanding important concepts and their correlation to the practice of clinical medicine.

GMS 6542 Basic Medical Pharmacology 3 cr hrs.

*Course Director: Carlos Calligari, Ph.D.*

The course presents a concise introduction to human pharmacology, emphasizing an understanding of the pharmacology principles that govern interaction between drugs, xenobiotics and humans and the relationship to modern medical diagnostics and therapy.
Graduate Catalog Entry

Graduate Certificate in Pharmacy Sciences

Course location/delivery: This program is offered fully online.

Brief Description: during the past decade there has been a movement for the practice of pharmacy to move away from the original focus of pharmacy product in the form of prescription and over-the-counter medications towards a more health-care related focus on patient care. The role of the pharmacist during this time has evolved from one of supplying pharmaceutical product towards activity as a health care provider to patients, and as an expert resource for physicians and other allied health professionals. The pharmacist is charged with the responsibility to ensure that a patient’s drug therapy is appropriate, is effective, is convenient, and taken under the safest possible conditions. By undertaking this new clinical role, pharmacists are positioned to make a significant contribution to achieving a positive outcome of medication therapy and improving the quality of life of patients. The enhanced clinical role of the pharmacist in patient care requires a strong basic biomedical science foundation upon which a pharmacy curriculum may be taught and mastered.

In recent years, almost all health-related educational associations have called for an interdisciplinary approach to health care. Pharmacy healthcare providers have been recognized as a key component for interdisciplinary health, and thus are in high demand. Educational institutions all across the country are attempting to meet the demand by increasing the number of pharmacy graduates produced. The Doctor of Pharmacy (Pharm.D.) curricula throughout the accredited colleges and schools of pharmacy now focus on a patient-centered learning model that represents the changing paradigm of pharmaceutical care throughout the country. The new pharmacy curriculum standards around the country require incoming pharmacy students to have a solid foundation in the basic clinical sciences prior to beginning the pharmacy program.

This graduate certificate will provide prospective pharmacy students entering the professional programs with a solid foundation in the biomedical sciences required to successfully complete the pharmacy curriculum. The courses provide content related to the physiology of the human body, microbiological and immunological activity, intermediary metabolism and the principles involved in drug action in the human body. Participants will extend their knowledge in key biomedical science areas necessary to understand the administration and implementation of pharmaceutical agents to patients with particular disease states. Pharmacotherapeutic principles taught in pharmacy programs focus on patient-centered learning, and require the integration of basic and clinical sciences for the appropriate delivery of pharmaceutical care in the patient setting.

This graduate certificate offers the opportunity for students involved in basic science-related backgrounds to begin the transition to the clinical doctorate in pharmacy. For students that have an interest in providing pharmaceutical care as a career, this certificate provides the necessary coursework to successfully attain the principles of pharmacotherapy, and the implementation of pharmaceutical care as a pharmacist clinician.

Credit towards graduate degree: Up to 12 hours of certificate course credits may be applied towards a graduate degree with program approval.

Transfer credit: None.
Standardized tests: GRE testing is not required for admission to the certificate program. However, the GRE (MCAT) is required for admission to the graduate degree programs.

Admission requirements: The prerequisites for admission to this certificate are:
A bachelor’s degree or its equivalent from any accredited college, preferably in any of the biological sciences or chemical sciences.
PCAT, GRE and MCAT scores can also be used to demonstrate qualitative and quantitative skills.

Application process: Please visit http://www.outreach.usf.edu/gradcerts/admissions.asp to download an application. In addition to the application forms please submit:
Official transcripts
A resume
A 250 word statement of interest describing your objectives in pursuing this course of study.

Registration process: First, consult with the certificate program advisor and obtain an electronic course permit if necessary. Then go to http://usfsonline.admin.usf.edu, the link to OASIS, USF’s online registration system. Follow instructions given online.

Tuition and fees: Fees parallel that of standard “on-line” graduate level courses. Please visit http://usfweb.usf.edu/pfs/tuition_cost.htm to view current tuition and fees.

Financial aid: Non-degree seeking students are not eligible for financial aid. Please contact the Financial Aid Office at 813-974-4700 for exceptions and the names of private lenders.

Time limit: Courses must be completed within two years.

Required courses:
GMS 6141 Basic Medical Immunology and Microbiology 3 cr. hrs.
The course focuses on the fundamental aspects of immunology and microbiology that are critical to understanding the nature of the immune response and identify the various microbiological agents that are relevant to human health and disease.
GMS 6201 Basic Medical Biochemistry 3 cr. hrs.
The course examines fundamental aspects of biochemistry critical to understanding the chemical and cellular mechanisms relevant to health and disease including intermediary metabolism, enzymology and storage and transfer of genetic information.
GMS 6440 Basic Medical Physiology 3 cr. hrs.
The course presents a concise introduction to the study of human physiology from a perspective of the function of various human organ systems with an emphasis on understanding important concepts and their correlation to the practice of clinical medicine.
GMS 6542 Basic Medical Pharmacology 3 cr. hrs.
The course presents a concise introduction to human pharmacology, emphasizing an understanding of the pharmacology principles that govern interaction between drugs, xenobiotics and humans and the relationship to modern medical diagnostics and therapy.

Total program hours: 12 credit hours.
Contact information: Kevin Sneed, Pharm.D.

Graduate Certificate in Pharmacy Sciences