Texas A&M University
Departmental Request for a New Course
- Undergraduate • Graduate • Professional
- Submit original form and attach a course syllabus.

1. This request is submitted by the Department of Nutrition and Food Science

2. Course prefix, number and complete title of course: NUTR 640 Therapeutic Microbiology I

3. Catalog course description (not to exceed 50 words): Alimentary (gastrointestinal) microbiology including: (i) the "normal" intestinal microbiota; (ii) probiotic & prebiotic nutritional supplements; (iii) recombinant pharmabiotics; (iv) gut-associated lymphoid tissue & mucosal immunity; (v) foodborne gastrointestinal pathogens; and (vi) fermented products as functional foods.

4. Prerequisite(s): Undergraduate survey course in microbiology (or instructor's consent)

5. Is this a variable credit course? ☐ Yes ☒ No If yes, from ________ to ________

6. Is this a repeatable course? ☐ Yes ☒ No If yes, this course may be taken ________ times. Will this course be repeated within the same semester? ☐ Yes ☒ No

7. Has this course been taught as a 489/689? ☐ Yes ☒ No If yes, how many times? 2

   Indicate the number of students enrolled for each academic period it was taught. 08A - 10, 08C - 11

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history) NOT REQUIRED
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography) OPEN TO ALL MAJORS

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix Course # Title (excluding punctuation)

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<th>Lab</th>
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<th>CIP and Fund Code</th>
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Approval recommended by:

Department Head - Type Name & Sign Date

Department Head - Type Name & Sign Date (if cross-listed course)

Submitted to Coordinating Board by:

Associate Director, Curricular Services

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services -- 12/08
Texas A&M University

Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. This request is submitted by the Department of Nutrition and Food Science

2. Course prefix, number and complete title of course: NUTR 640 Therapeutic Microbiology: Probiotics and Related Strategies

3. Catalog course description (not to exceed 50 words): Covers topics relevant to alimentary (gastrointestinal) microbiology including: (i) the "normal" intestinal microbiota; (ii) probiotic & prebiotic nutritional supplements; (iii) recombinant pharmabiotics; (iv) gut-associated lymphoid tissue & mucosal immunity; (v) foodborne gastrointestinal pathogens; and (vi) fermented products as functional foods.

4. Prerequisite(s): Undergraduate survey course in microbiology (or instructor’s consent)

Cross-listed with: FSTC 640

Cross-listed courses require the signature of both department heads.

5. Is this a variable credit course? Yes ☐ No ☒ If yes, from _____ to _____

6. Is this a repeatable course? Yes ☐ No ☒ If yes, this course may be taken _____ times.

Will this course be repeated within the same semester? Yes ☐ No ☒

7. Has this course been taught as a 489/689? Yes ☒ No ☐ If yes, how many times? 2

Indicate the number of students enrolled for each academic period it was taught. 08A - 10; 08C - 11

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Submitted to Coordinating Board by:

Associate Director, Curricular Services

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services – 12/08
NUTR 640
Therapeutic Microbiology I  
NUTR 640  
TR 8:00 AM – 9:15 AM  
HPCT 102

Course description: Alimentary (gastrointestinal) microbiology including: (i) the "normal" intestinal microbiota; (ii) probiotic & prebiotic nutritional supplements; (iii) recombinant pharmaiotics; (iv) gut-associated lymphoid tissue & mucosal immunity; (v) foodborne gastrointestinal pathogens; and (vi) fermented products as functional foods.

Course rationale: To provide students with in-depth, scientifically-rigorous exposure to topics relevant to therapeutic microbiology.

Instructor: Joseph Sturino, Ph.D.  
Assistant Professor  
214C Cater-Mattil Hall  
Phone: (979) 845-2142  
E-mail: joseph.sturino@tamu.edu

Office Hours: By appointment

Prerequisite: Undergraduate survey course in microbiology (or instructor's consent)

ISBN 978-1-55581-403-8

Required articles are available on the companion website: http://agonline.tamu.edu/nutr489/

Enrollment: 40 Students Maximum

Objectives: By semesters end, with sufficient classroom participation, students will be able to: (i) discuss basic and advanced principals related to probiotic and alimentary microbiology and (ii) interpret the meaning of data associated with microbiological research.

Student Evaluation:

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<th>Undergraduate Evaluation:</th>
<th>Graduation Evaluation:</th>
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<tr>
<td>Examination 1 30 points</td>
<td>Examination 1 20 points</td>
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<td>Examination 2 30 points</td>
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<td>Examination 3 30 points</td>
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<td>Attendance 10 points</td>
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<td>Project 30 points</td>
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<td><strong>TOTAL 100 points</strong></td>
<td><strong>TOTAL 100 points</strong></td>
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Final grade:

A  
B  
C  
D  
F  

90 – 100  
80 – 89  
70 – 79  
60 – 69  
< 60  

Grades may be curved at the instructor's discretion.
Class policies:

Attendance: A portion of your grade is determined by class attendance. University rules apply governing what constitutes an excused absence. The following link lists what Texas A&M considers excusable absences: http://student-rules.tamu.edu/rule7.htm. Absences caused by illness or injury will need to be accompanied by a physician's note. Please be aware that the validity of notes may be confirmed through the physician's office.

Plagiarism: As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated.

Academic Integrity: Plagiarism or Cheating on any assignment will not be tolerated, and it will be recommended that you receive an “F” in this course if evidence of plagiarism is found. As stated in Texas A&M’s Student Rules: Student Rule 2.15: Plagiarism is the intentional use of ideas, words or data of another person without giving appropriate credit. Student Rule 20.1: Commission of the following acts shall constitute scholastic dishonesty. Student Rule 20.1.3: Plagiarism: Failing to credit sources used in a work product in an attempt to pass off the work as one's own. Attempting to receive credit for work performed by another, including papers obtained in whole or in part from individuals or other sources. Student Rule 20.1.4: Conspiracy: Agreeing with one or more persons to commit an act of scholastic dishonesty. Aggies do not lie, cheat, or steal, nor do they tolerate those who do.

Americans with Disabilities Act (ADA) Policy Statement: The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room B118 of Cain Hall or call (979) 845-1637.

Cell phones: Cell phones and beepers must be turned off or to vibrate. If it is an emergency and you must take a call, please leave the classroom.

Evaluation Criteria:

Attendance (10 Points):
- Students are expected to attend each class session.
- 1 point will be deducted for each class missed.
- Students are expected to read articles prior to class.

Three Examinations:
- Questions will be formatted as multiple choice, fill in the blank, and/or short answer.
- Partial credit may be given at the instructor's discretion.

Graduate Student Project:
- Write a review on instructor-approved topics related to the probiotics or prebiotic modulation of the alimentary microbiota. See accompanying instructions.
Graduate Student Final Project Guidelines:

Literature Review

Graduate Students must submit a Literature Review on an approved topic relevant to Alimentary Microbiology that will be evaluated as a component (30%) of their final grade.

Review Topics must be submitted to and approved by the instructor via e-mail (joseph.sturino@tamu.edu). The subject of the Literature Review should be relevant to the topics outlined in the course syllabus. These areas are very broad and students should select a narrower focus from within these categories:

- The "normal" intestinal microbiota (in health or disease)
- Probiotic and/or prebiotic nutritional supplements
- Recombinant pharmabiotics
- Gut-associated lymphoid tissue & mucosal immunity
- Foodborne gastrointestinal pathogens
- Fermented products as functional foods

Review Format:

- Literature Reviews should be divided into 5 sections:
  
  Abstract
  Review (which should have subsections)
  References
  Figure Legends
  Tables & Figures

- Literature Reviews must be 13 pages in length (or more), including abstract (approximately 1 page), body of the Review, Figure Legends, & references. Figures and tables should also be included, but do not count towards the 15 page limit (although the figure legends do).
- Text (including figure legends and references) must be double-spaced.
- Page Setup: 1” margins, 8½” x 11”, 12 pt. font.
• Papers should have consecutive line numbering.
• Pagers should have page numbers.
• The references should be formatted according to the American Society for Microbiology Applied and Environmental Microbiology Instructions for Authors document (pp. 10-11)
  http://aem.asm.org/misc/ifora.shtml

Genetic/chemical nomenclature should also be cited according to the American Society for Microbiology Applied and Environmental
• Microbiology Instructions for Authors document
  http://aem.asm.org/misc/ifora.shtml

Section Content:

• The Abstract is limited to no more than one typed page. The Abstract should concisely summarize the basic content of the Literature Review.
• With regards to the flow and subdivision of the Review itself, students should consider Nature Reviews Microbiology an excellent resource to emulate:
  http://www.nature.com/nrmicro/index.html
• The references should be formatted according to the American Society for Microbiology Applied and Environmental Microbiology Instructions for Authors document (pp. 10-11)
  http://aem.asm.org/misc/ifora.shtml

Instructor Evaluation:

• Students may elect to submit a draft of their review to the instructor. These drafts are not graded, but the instructor will offer suggestions for improvement.
• Students intending to take advantage of this opportunity MUST submit the draft to the instructor by 5 PM on Thursday, 6 November 2008 (via email in PDF format).
• The instructor will review only one draft per person.
• Have someone edit your manuscript for grammatical errors prior to submitting.
Final Papers must be submitted in PDF format to joseph.sturino@tamu.edu by 8 AM on Tuesday, 25 November 2008.

Beware:

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**Cheating:** Aggies do not lie, cheat, or steal, nor tolerate those who do

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**Tentative Class Schedule**

**Download Articles:**
http://agonline.tamu.edu/nutr489/sched.html

**UNIT 1:**
THE INDIGENOUS MICROBIOTA IN HEALTH AND DISEASE

**WEEK 1**
7/26
*Sturino teaching class 8: 00 AM – 9:15 AM*

*Course Introduction*

*Versalovic and Wilson: Chapter 1 (Introduction)*

*Versalovic and Wilson: Chapter 17 (Probiotics in Human Medicine: Overview)*

7/28
*Sturino teaching class 8: 00 AM – 9:15 AM*

*The Gastrointestinal Tract and its Indigenous Microbiota*

*Versalovic and Wilson: Chapter 2 (Role of the Indigenous Microbiota in Health/Disease)*

*Review: The normal microbiota*

*Research Article: Biofilms in the large bowel suggest an apparent function of the human vermiform appendix*

**WEEK 2**
9/2
*Class Cancelled*
**WEEK 3**

9/9  
*Sturino teaching class 8: 00 AM – 9:15 AM*  
**Microbial Imprinting**  
*Versalovic and Wilson: Chapter 4 (Bifidobacteria: the Model Human Gut Commensal)*  
**Research Article:** Development of the Human Infant Intestinal Microbiota

9/11  
*Sturino teaching class 8: 00 AM – 9:15 AM*  
**Cooperative Metabolism and Energy Harvest**  
*Research Article:* A top-down systems biology view of microbiome-mammalian metabolic interactions in a mouse model  
*Research Article:* An obesity-associated microbiome with increased capacity for energy harvest

**WEEK 4**

9/16  
*Sturino teaching class 8: 00 AM – 9:15 AM*  
**Hormone Modulation**  
*Research Article:* The gut microbiota as an environmental factor that regulates fat storage  
*Research Article:* Mechanisms underlying the resistance to diet-induced obesity in germ-free mice

9/18  
*Sturino teaching class 8: 00 AM – 9:15 AM*  
**Review:** Inflammatory Bowel Disease

**WEEK 5**

9/23  
*Sturino teaching class 8: 00 AM – 9:15 AM*  
**Review:** Toll-like receptors and innate immunity in gut homeostasis and pathology.  
*Research Article:* IgA response to symbiotic bacteria as a mediator of gut homeostasis.

9/25  
*Sturino teaching class 8: 00 AM – 9:15 AM*  
**Examination 1**

**UNIT 2:**  
**PROBIOTICS AND MICROBE REPLACEMENT THERAPY**

**WEEK 6**

9/30  
*Sturino teaching class 8: 00 AM – 9:15 AM*  
**General Mechanisms for Probiotic Functionality**  
*Versalovic and Wilson: Chapter 20 (Probiotics in Gastrointestinal Diseases)*  
**Review:** Mechanisms of Action of Probiotics in Intestinal Diseases

10/2  
*Sturino teaching class 8: 00 AM – 9:15 AM*  
**Strain Selection, Characterization, Augmentation, and Delivery**  
*Versalovic and Wilson: Chapter 8 (Formulation, Administration and Delivery of Probiotics)*  
*Versalovic and Wilson: Chapter 15 (Genomics of Lactic Acid Bacteria)*

**WEEK 7**

10/7  
*Sturino teaching class 8: 00 AM – 9:15 AM*  
**The Lactobacilli**  
*Versalovic and Wilson: Chapter 3 (Lactobacilli)*  
*Research Article:* Soluble proteins produced by probiotic bacteria regulate intestinal epithelial cell survival and growth.  
*Research Article:* Modification of *Lactobacillus* beta-glucuronidase activity by random mutagenesis

10/9  
*Sturino teaching class 8: 00 AM – 9:15 AM*  
**Immunomodulation**
Versalovic and Wilson: Chapter 18 (Allergy and Autoimmune Diseases)

**Research Article:** Lactobacilli activate human dendritic cells that skew T cells toward T helper 1 polarization

**Research Article:** Anti-inflammatory properties of *Lactobacillus gasseri* expressing manganese superoxide dismutase using the interleukin 10-deficient mouse model of colitis.

### WEEK 8
10/14  Class Cancelled
10/16  Class Cancelled

### WEEK 9
10/21  **Sturino teaching class 8: 00 AM – 9:15 AM**

**Probiotics and the Genitourinary Tract**

*Versalovic and Wilson: Chapter 21 (Probiotics and Diseases of the Genitourinary Tract)*

**Research Article:** Activity of HIV entry & fusion inhibitors expressed by the human vaginal colonizing probiotic *Lactobacillus reuteri* RC-14

**Research Article:** Inhibition of HIV infectivity by a natural human isolate of *Lactobacillus jensenii* engineered to express functional two-domain CD4.

10/23  **Sturino teaching class 8: 00 AM – 9:15 AM**

**Probiotics and Oral Biology**

*Versalovic and Wilson: Chapter 6 (Streptococci)*

*Versalovic and Wilson: Chapter 19 (Probiotics in Oral Biology and Dentistry)*

### WEEK 10
10/28  **Sturino teaching class 8: 00 AM – 9:15 AM**

**Phage Therapy and Related Strategies**

*Versalovic and Wilson: Chapter 28*

**Review:** Taking aim on bacterial pathogens: from phage therapy to enzybiotics.

10/30  **Sturino teaching class 8: 00 AM – 9:15 AM Examination 2**

### UNIT 3:

**PREBIOTICS: DIETARY FACTORS THAT AFFECT MICROBIOTA COMPOSITION**

### WEEK 11
11/4  **Sturino teaching class 8: 00 AM – 9:15 AM**

*Versalovic and Wilson: Chapter 9 (Introduction to Prebiotics)*

*Versalovic and Wilson: Chapter 10 (Human Milk Oligosaccharides)*

**Review:** Structural and functional aspects of prebiotics used in infant nutrition.

11/6  **Sturino teaching class 8: 00 AM – 9:15 AM**

*Versalovic and Wilson: Chapter 23 (Prebiotics in Human Medicine)*

### WEEK 12
11/11  **Sturino teaching class 8: 00 AM – 9:15 AM**

*Versalovic and Wilson: Chapter 11 (Inulin-Type Fructans)*

*Versalovic and Wilson: Chapter 12 (Resistant Starch)*

**Research Article:** Effect of inulin on the human gut microbiota: stimulation of *Bifidobacterium adolescentis* and *Faecalibacterium prausnitzii*

11/13  **Sturino teaching class 8: 00 AM – 9:15 AM**

*Versalovic and Wilson: Chapter 13 (Effects on Bone Mineral Metabolism and Weight)*

*Versalovic and Wilson: Chapter 14 (Effects on Lipid Metabolism)*
WEEK 13
11/18  Sturino teaching class 8: 00 AM – 9:15 AM
       Versalovic and Wilson: Chapter 24 (Synbiotics in Human Medicine)
       Research Article: Long-term colonization of a Lactobacillus plantarum synbiotic preparation in
       the neonatal gut.
11/20  Sturino teaching class 8: 00 AM – 9:15 AM
       Examination 3

WEEK 14
11/25  Class Cancelled
11/27  Class Cancelled (Thanksgiving holiday)