**Prerequisite:** relationships of prostaglandins, prostacyclins, thromboxanes, and acid and related essential fatty acid metabolism. Structure-activity

**Biochemical, physiological, and nutritional aspects of arachidonic**

**3 Credits**

**VBSC 514: Prostaglandins and Leukotrienes**

Cross-listed with: BMMB 511, MCIBS 511 with an enrollment limit of 20 students BMMB graduate programs. The course will be offered in the fall semester focusing areas in the MCIBS graduate program and for the Pathobiology and projected as an elective for the Molecular Medicine and Immunobiology general understanding of immunology and biochemistry. This course is

**Immunology, virology, and biochemistry. The prerequisites of MICRB 410**

**Reviews of recently published papers and a short research proposal**

**Presentations of papers related to the material. In addition, written critical**

**Disciplines, in particular cell biology and biochemistry, and to provide**

**Behavior of proteins and organelles within cells, and to appreciate how**

**Intracellular events influence interactions of cells with one another in**

**Multicellular systems and during development. Another major focus**

**Will be genome architecture, both in the context of evolution and gene**

**Expression. Students will also learn how genetic approaches can be used**

**To understand cell and molecular biology, and will develop critical thinking**

**Skills through the analysis of the primary scientific literature. The course**

**Will include lecture and discussion sessions.**

Cross-listed with: BIOL 503, BMMB 503, MCIBS 503

**VBSC 511: Molecular Immunology**

2 Credits

**The study of molecular and biochemical events that influence immune**

**Responses and define current questions in immunology. BMMB 511 /**

**MCIBS 511 / VBSC 511 Molecular Immunology (2) The goals of the**

**Course are to integrate the current questions of immunology with other**

**Disciplines, in particular cell biology and biochemistry, and to provide**

**Training in critical thinking and evaluation of data and experiments. The**

**Course will be approximately 2/3 lecture by the instructor and 1/3 student**

**Presentations of papers related to the material. In addition, written critical**

**Reviews of recently published papers and a short research proposal**

**Will be assigned. By focusing on the mechanisms involved in immunity**

**And disease, this course complements several existing courses on**

**Immunology, virology, and biochemistry. The prerequisites of MICRB 410**

**And BMB 400 assure that the students enrolling in the course have a**

**General understanding of immunology and biochemistry. This course is**

**Projected as an elective for the Molecular Medicine and Immunobiology**

**Focus areas in the MCIBS graduate program and for the Pathobiology and**

**BMBM graduate programs. The course will be offered in the fall semester**

**With an enrollment limit of 20 students**

**Prerequisite:** B M 400, MICRB410

Cross-listed with: BMMB 511, MCIBS 511

**VBSC 514: Prostaglandins and Leukotrienes**

3 Credits

**Biochemical, physiological, and nutritional aspects of arachidonic**

**Acid and related essential fatty acid metabolism. Structure-activity**

**Relationships of prostaglandins, prostacyclins, thromboxanes, and**

**Leukotrienes**

**Prerequisite:** BIOCH402 or BIOCH437

Cross-listed with: NUTR 514

**VBSC 520: Pathobiology**

3 Credits

**The course deals with the mechanism of disease. Topics are:**

**Homeostasis, vascular injury, inflammation, neoplasia, genetic disorders,**

**And biochemical toxicology. VB SC 520 Pathobiology (3) Upon completion**

**Of VB SC 520, Pathobiology, students will have an understanding of**

**Disease processes with emphasis on changes at both the tissue and**

**Systemic levels. During the first portion of the course, the student**

**Will have the opportunity to examine the role of infectious agents,**

**Inflammation, genetics, metabolism and neoplasia in the disease**

**Process. Students will integrate their knowledge of general microbiology,**

**Cell biology, histology and biochemistry in understanding these**

**Processes. The student will understand how differing disease phenotypes**

**Can be caused by different underlying etiologies in an organism. During**

**The second portion of the course the student will gain knowledge**

**Concerning disease processes of different organ systems building on**

**The general principles learned in the first portion. Topics are organized**

**And presented in a format that covers the basics of normal anatomy and**

**Histology progressing to an analysis of the abnormalities associated**

**With various disease states arising from multiple etiologies. While the**

**Human model will be discussed most extensively, there are numerous**

**Applications to other mammalian species. The student will learn**

**Considerable medical terminology and clinical concepts. The course**

**Has been modeled after introductory pathology courses currently**

**Taught at major medical schools. It should be of interest to graduate and**

**Undergraduate students in life sciences who wish to become familiar with**

**The various underlying mechanisms, including molecular mechanisms,**

**Which give rise to the disease phenotype. The course is an excellent**

**Preparation for students wishing to pursue advanced study in medicine or**

**Veterinary science.**

**Prerequisite:** V SC 420; BIOCH401 or BIOCH437

**VBSC 534: Current Topics in Cancer Research**

3 Credits

**A discussion of current cancer research literature with the focus on**

**Primary research literature. VB SC 534 Current Topics in Cancer Research**

**(3) Students enrolled in Current Topics in Cancer Research will acquire**

**Knowledge of focused areas in cancer research including basic biology**

**Of cancer cells, genes and signaling pathways that control cancer cell**

**Growth and metastasis, molecular methods for analysis of human and**

**Animal cancers, specific animal models of cancer and molecular**

**Approaches to cancer therapy. Emphasis will be placed on critical reading**

**Of primary literature, identification of strengths and weaknesses of**

**Methods, approach and conclusions of specific studies and implications**

**Of the research for future studies and understanding of cancer and**

**Therapy. This course will provide a solid foundation and companion for**

**Other specialized courses in a diverse group of graduate degree programs**

**As well as the critical thinking and analysis required for completion of a**

**Doctoral program.**

**Prerequisite:** BIOL 413 or BIOL 416 or B M 400 or B M 443 or B M 460

**VBSC 535: Oncology: Bench to Bedside**

3 Credits

This course is required for graduate students in the MCIBS program who are in the Cancer Biology Emphasis Area. It is designed to give students
who are studying cancer at a molecular, reductive level experience with
the clinical aspects of the disease. The course will be held at Mt. Nittany
Medical Center once a week for 3 hrs, in both patient-oriented, hands-on
and didactic settings to understand how cancer is diagnosed, imaged,
and treated, how patient care and side effects of therapy are managed,
and the importance of clinical trials in developing new treatments for
cancer. For each subject area students will spend 2 hours engaged in
a clinical experience related to cancer under the supervision of course
directors or additional clinicians at Mt. Nittany, followed by a 1 hour
lecture/didactic session on a related topic. In addition to broad learning
objectives, this course will make students aware of critical issues in
cancer biology and treatment that may serve as a springboard for future
research.

**Prerequisite:** MCIBS 503, MCIBS 590, BIOL 416; VBSC 534

**VBSC 590: Colloquium**
1-3 Credits/Maximum of 3

Continuing seminars which consist of a series of individual lectures by
faculty, students, or outside speakers.

**VBSC 596: Individual Studies**
1-9 Credits/Maximum of 9

Creative projects, including nonthesis research, which are supervised on
an individual basis and which fall outside the scope of formal courses.

**VBSC 597: Special Topics**
1-9 Credits/Maximum of 9

Formal courses given on a topical or special interest subject which may
be offered infrequently; several different topics may be taught in one year
or semester.

**VBSC 597A: **SPECIAL TOPICS** **
1-3 Credits

**VBSC 597B: **SPECIAL TOPICS** **
1-2 Credits

**VBSC 597F: **SPECIAL TOPICS** **
1 Credits

**VBSC 597G: **SPECIAL TOPICS** **
1 Credits

**VBSC 600: Thesis Research**
1-15 Credits/Maximum of 999

No description.

**VBSC 601: Ph.D. Dissertation Full-Time**
0 Credits/Maximum of 999

No description.