

LSC Use Only Proposal No: \_\_\_\_\_ LSC Action-Date: AP-2/14/13 UWUCC Use Only Proposal No: 12-83 UWUCC Action-Date: AP-3/12/13 Senate Action Date: App-3/26/13

**Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee**

Contact Person(s) <b>Bharathan Narayanaswamy</b>	Email Address <b>bharathn@iup.edu</b>
Proposing Department/Unit <b>Biology</b>	Phone <b>724-357-2584</b>

Check all appropriate lines and complete all information. Use a separate cover sheet for each course proposal and/or program proposal.

**1. Course Proposals (check all that apply)**

New Course                       Course Prefix Change                       Course Deletion  
 Course Revision                       Course Number and/or Title Change                       Catalog Description Change

Current course prefix, number and full title: **BIOL 117 Understanding HIV Biology and AIDS**

Proposed course prefix, number and full title, if changing:

**2. Liberal Studies Course Designations, as appropriate**

This course is also proposed as a Liberal Studies Course (please mark the appropriate categories below)

Learning Skills     Knowledge Area     Global and Multicultural Awareness     Writing Intensive (include W cover sheet)  
 Liberal Studies Elective (please mark the designation(s) that applies – must meet at least one)

Global Citizenship                       Information Literacy                       Oral Communication  
 Quantitative Reasoning                       Scientific Literacy                       Technological Literacy

**3. Other Designations, as appropriate**



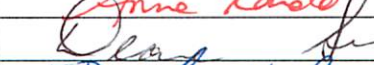

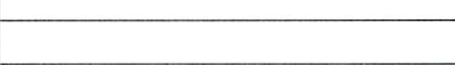

Honors College Course                       Other: (e.g. Women's Studies, Pan African)

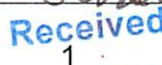


**4. Program Proposals**

Catalog Description Change     Program Revision     Program Title Change     New Track  
 New Degree Program     New Minor Program     Liberal Studies Requirement Changes     Other

Current program name:

Proposed program name, if changing:

5. Approvals	Signature	Date
Department Curriculum Committee Chair(s)		16 Nov 2012
Department Chairperson(s)		12/4/2012
College Curriculum Committee Chair		2/6/13
College Dean		2/7/13
Director of Liberal Studies (as needed)		2/18/13
Director of Honors College (as needed)		
Provost (as needed)		
Additional signature (with title) as appropriate		
UWUCC Co-Chairs		3/13/13

    
 MAR 13 2013    FEB 15 2013    FEB 8 2013  
 Liberal Studies    Liberal Studies    Liberal Studies

## Part II.

### 1. New Syllabus of Record

#### Catalog Description

BIOL 117 Understanding HIV Biology and AIDS

3c-0l-3cr

Prerequisites: Non-Biology department majors and minors only

An introduction to the mode of infection and prevention of AIDS virus which are used as an illustration of biological principles. Profiles biological indicators for HIV disease and its progression to AIDS. Therapeutic and non-therapeutic approaches to treat HIV infections are emphasized. (Does not count toward Biology Electives, Controlled Electives, or Ancillary Sciences for Biology majors and minors.)

#### II a. Course Outcomes and Assessment (Expected Undergraduate Student Learning Outcomes – EUSLO)

##### **Objective 1:**

Describe and analyze the general characteristics of HIV transmission as a means to interpret the Biology of virus.

##### **Expected Student Learning Outcomes 1 and 2:**

Informed and Empowered Learners

##### **Rationale:**

Assignments will require students to have a level of knowledge of circulatory system and immunology that will enable them to understand how these systems work.

Assignments will also require students to critically analyze immune systems modalities and to use this analysis to explain how HIV testing is interpreted.

##### **Objective 2:**

Compare how general virus transmission has been perceived throughout the ages by identifying the common and uncommon modes of transmission of the HIV and AIDS.

##### **Expected Student Learning Outcome 2:**

Empowered Learners

##### **Rationale:**

Assignments will require students to evaluate common modes of virus transmission (air-borne, water, vector and non-vector, and blood). In addition, these assignments will engage students in assessing a knowledge base in science and how that knowledge influenced the perception and treatment of individuals infected with HIV.

##### **Objective 3:**

Describe how HIV infection and AIDS is perceived and dealt with in today's society.

**Expected Student Learning Outcome 3:**

Responsible Learners

**Rationale:**

Assignments will require students to assess their own views of HIV and AIDS infection and how they compare to ethical judgments and social responsibilities in various societies around the world. They will also explore how their personal actions and civic values influence their perception of people having AIDS. Other assignments will have the students analyze AIDS issues in the public realm (e.g. national, state, or local) and to use this analysis to determine how their personal lives are and will be affected.

**Objective 4:**

Assess historical figures in the last 40 years who have made contributions to our understanding of HIV and AIDS

**Expected Student Learning Outcome 1 and 2:**

Informed and Empowered Learners

**Rationale:**

Assignments will require students to gain an understanding of how we have arrived at our current understanding of HIV transmission and prevention by analyzing the distribution of HIV among individuals and populations throughout last three decades. They will then apply these analyses to the evaluation of their own view of HIV transmission and prevention.

**III. Course Outline**

- |  |           |
|--|-----------|
| A. Introduction - What is virus?   | (3 hours) |
| <ol style="list-style-type: none"> <li>1. Biological agents causing diseases in humans</li> <li>2. How viruses differ from other agents</li> <li>3. Characteristics of viruses</li> <li>4. Viruses infecting plants, animals and humans</li> </ol>   |           |
| B. The discovery of HIV and naming the illness   | (7 hours) |
| <ol style="list-style-type: none"> <li>1. AIDS a disease or syndrome</li> <li>2. Defining the illness: AIDS surveillance</li> <li>3. Naming of the AIDS virus HIV-1, HIV-2, and HTLV-III</li> <li>4. Circulatory system—blood, arteries, veins-HIV in blood</li> <li>5. Immune system—human lymphocytes-T-cells, B-cells</li> <li>6. Origin of HIV—Biological warfare, virus from cats and old world monkeys</li> <li>7. Characteristics of HIV—retrovirus, stability of HIV</li> <li>8. HIV mutations and source of variants</li> </ol> |           |
| Exam 1   | (1 hour)  |
| C. Following virus transmission through the ages – HIV transmission  | (3 hours) |
| <ol style="list-style-type: none"> <li>1. Introduction – virus transmission: an overview</li> <li>2. Common modes of transmission of HIV—household settings, insects and other</li> </ol>  |           |

Vectors, non-casual transmission

3. HIV in blood, virus load in blood and blood product transmission
4. HIV in Genital fluids, saliva and other body fluids
5. Sexual transmission of HIV, Injection and drug use
6. Maternal-child transmission

**D. Preventing the transmission of HIV (3 hours)**

1. Quarantine principles and practices
2. Barrier to HIV infection, safer sex—how do I protect myself? Risk factors
3. Education—schools, colleges—Disease prevention and health promotion
4. Blood collection and blood screening for HIV
5. Infection control procedures—AIDS prevention programs

**E. Therapy for HIV disease (3 hours)**

1. General concept for antimicrobial therapy—treatment vs cure (is there a cure?)
2. anti-HIV therapies—FDA approved drugs, antibody based approach, protease inhibitors
3. Vaccine development—is there a vaccine? Ideal properties of effective vaccine
4. Combination drug AIDS therapy—Opportunities and challenges of drug therapy

**Exam 2 (1 hour)**

**F. Prevalence of HIV infection and AIDS cases in the United States (3 hours)**

1. Risk groups and AIDS cases
2. Health care workers
3. Childbearing women, HIV infections in newborns
4. Testing—who should be tested? What does positive test mean?

**G. Prevalence of HIV infection and AIDS cases outside the United States—Global prospective (3 hours)**

1. Global patterns of HIV transmission and prevalence of AIDS
2. AIDS epidemic in Asia, Africa, and Latin America
3. Economics of preventing HIV infection in developing countries

**H. Global strategy to combat the spread of HIV and AIDS (4 hours)**

1. Youth---Create educational and economic opportunities—provide formal sexual health education in schools, offering youth friendly health and prevention services
2. Women—Overcome social obstacles to empower women to control their health—create economic opportunities as means to avoid risk behavior, increase access reproductive health care, formation of support groups
3. Men—Work against aggressive social behavior, foster responsible social behavior
4. Role of National Governments working with civil societies and United Nations efforts through WHO

Exam 3 (1 hour)

- I. Biological indicators for HIV disease and Progression to AIDS (3 hours)
1. Stages of HIV disease—Asymptomatic stage, chronic stage, AIDS stage
  2. Production of HIV specific antibodies
  3. Infection of the Central Nervous system
  4. Clinical indicators of AIDS diagnosis
- J. Endemic, epidemic, and pandemic nature of AIDS (3 hours)
1. A re-evaluation of distribution of AIDS in a global society
  2. Pragmatic and multidisciplinary approaches—to prevent spread
  3. Role of Government and Gates Foundation in HIV prevention
  4. Living with AIDS-Human Dimensions—confronting the news of infection
- K. Current studies and models of AIDS management (4 hours)
1. CDC role– current guidelines: Discussion of selected papers from the CDC *HIV/AIDS Prevention among Hispanic/Latino Communities: colloquium “The DC’s Hispanic/Latino Consultation, April 1-2, 2008”*
  2. A perfect world without HIV and AIDS--HAART
  3. An overview of major contributors in the field of HIV research today: David D. Ho, Dennis Burton, and Ben Lewin.

Final exam (four) during final exam week (2 hours)

#### IV. Evaluation Methods

1. 60% Four examinations (15% for each exam) – three during the semester and a fourth during exam week. Exams will be short answer essays.
2. 20% Four case studies (5% for each exam) - Students will be given four case studies. These case studies will have questions that must be answered and turned in by the student. Each case study will be worth 5% of the final grade.
3. 15% Students will develop one case study for the class. The case study will be based on articles and ideas gathered from sources such as newspapers, newsmagazines, and popular science and medical magazines (e.g. Discover Magazine, Science and Medicine or Journal of the American Medical Association). It will follow the format of the case studies given by the professor and will be worth 15% of their final grade. This will be a class assignment (no presentations in class).
4. 5% Critique of the non-textbook reading. Students will submit a critique with a maximum of five printed pages.

#### V. Grading Scale

Grading scale: A: 90-100%; B: 80-89%; C: 70-79%; D: 60-69%; F: 59% and below

## VI. Undergraduate Course Attendance Policy

The IUP attendance policy will be followed.

## VII. Required Textbook

Gerald J. J. Stine. 2012. *AIDS Update: An annual Overview of Acquired Immune Deficiency syndrome*. ISBN13: 9780073527659 McGraw Hill Publishers

### Supplemental Non-textbook reading

Barnett, T., and Whiteside, A., 2006. *AIDS in the Twenty-First Century: Disease and Globalization*. ISBN10: 1403997683. Palgrave Publishers

Hung, F., Conner, R., and Villarreal, L., 2012. *AIDS Science and Society* ISBN 0-7637-0086. Bartlett Publishers

Shelby, R.D., Aronstein, D.M. and Thompson, B.J., 1998. *HIV And Social Work: A Practitioner's Guide (Psychosocial Issues of HIV/AIDS)* ISBN10: 1560239069. Haworth Press, Inc.

### Suggested Readings

Carpenter, C.C., Fischl, M.A., Hammer, S.M., Hirsch, M.S., Jacobsen, D.M., Katzenstein, D.A., Montaner, J.S., Richman, D.D., Saag, M.S., Schooley, R.T., Thompson, M.A., Vella, S., Yeni, P.G., and Volberding, P.A. Antiretroviral therapy for HIV infection in 1998. Updated recommendations of the International AIDS Society-USA Panel. *JAMA* 280(1):78–86

Chakraborty, H., Newman, J.E., Woelk, G., Hemingway-Foday, J., Iriundo-Perez, J., Akam, W., et al. 2011. *Antiretroviral therapy initiation and CD4 progression over time among HIV infected adults in Central Africa*. *International Journal of Medicine and Public Health* 1 (4):3-11

CDC's Approach to Reducing HIV Infections in the United States. 2011. High-Impact HIV Prevention

CDC HIV Surveillance Report, 2010. Volume 22. Diagnoses of HIV Infection and AIDS in the United States and Dependent Areas

CDC HIV Surveillance—United States 2011. *MMWR* 60(21):689–693.

CDC Report Estimated lifetime risk for diagnosis of HIV infection among Hispanics / Latinos—37 states and Puerto Rico 2010. *MMWR* 59(40):1297–1301.

Ezekiel, K. 2003. *HIV and AIDS in Africa: Beyond Epidemiology*. Blackwell Publishers ISBN 0631223576

Ford, C.L, Whetten K.D, Hall S.A, Kaufman J.S, Thrasher A.D. 2007. Black sexuality, social construction, and research targeting 'The Down Low' ('The DL'). *Ann Epidemiology* 17(3):209–216

Harrison, D 2009. *'An Overview of Health and Health care in South Africa 1994-2010: Priorities, Progress and Prospects for New Gains'* Commissioned by the Henry J. Kaiser Family Foundation

Hunter, S. 2006. *AIDS in America* Macmillan Publishers ISBN 9781403971999

Heron M. *Deaths: Leading Causes for 2007*. National Vital Stat Rep; Vol. 59, No. 8. Hyattsville, MD: National Center for Health Statistics; 2011

Lloyd, S.W., Ferguson, Y.O., Corbie-Smith, G., Ellison, A., Blumenthal, C., Council, B.J., et al. 2012. *The Role of Public Schools in HIV Prevention: Perspectives from African Americans in the Rural South*. *AIDS Education and Prevention*, 24 (1):41-53.

Muula, S.A. 2008. HIV Infection and AIDS Among Young Women in South Africa *Croat Med J*. June; 49(3): 423–435.

Prejean J, Song R, Hernandez A, Ziebell R, Green T, Walker F, et al 2011. *Estimated HIV incidence in the United States, 2006–2009*. *PLoS ONE* 20 6(8):1–13

Salim, K. 2005. *HIV/AIDS in South Africa* Cambridge University press ISBN: 9780521616294

## VIII. Special Resource Requirements

None

## IX. Bibliography

Amaro, H. 2000. "On the margin: Power and women's HIV risk reduction strategies." *Sex Roles* 42(7-8): 723-749.

Bowleg, L. 2000. "Gender roles, power strategies, and precautionary sexual self-efficacy: Implications for Black and Latina women's HIV/AIDS protective behaviors." *Sex Roles* 42(7-8): 613-635.

Brian G. Williams, James O.Lloyd-Smith Eleanor Gouws, Catherine Hankins, Wayne M. Getz, John Hargrove, Isabelle de Zoysa, Christopher Dye, Bertran Auvert 2011. *The Potential Impact of Male Circumcision on HIV in Sub-Saharan Africa* *PLoS Medicine* 3:7 1032-1040

Buck, J., M. S. Kang, et al. 2005. "Barrier method preferences and perceptions among Zimbabwean women and their partners." *Aids and Behavior* 9(4): 415-422.

Campbell, C. A. 1995. "Male Gender-Roles and Sexuality - Implications for Womens Aids Risk and Prevention." *Social Science & Medicine* 41(2): 197-210.

Cellucci, L.W. & Celluci, T. 1998. *HIV disease and the elderly: Coming of age in the era of AIDS*. In *Social gerontology*, David E. Redburn & Robert P. McNamara, eds., pp.93-114. Westport, CT: Auburn House.

Frankenberg, R., P. Aggleton, et al. 1989. *One epidemic or three: Cultural, social and historical aspects of the AIDS pandemic*. Oxford, England, Falmer Press/Taylor & Francis, Inc. viii, 276 pp.

Freeman, A., Newman, J., Hemingway-Foday, J., Iriondo-Perez, J., Stolka, K., Akam, W., Balimba, A., Kalenga, L., Mbaya, M., Mfangam, M.B., Mukumbi, H., Niyongabo, T., Woelk, G., et al. 2012 *Comparison of HIV-positive women with children and without children accessing HIV care and treatment in the leDEA Central Africa cohort*. *AIDS Care*, 24 (6):673-679.

Gollub, E. L. 2000. "The female condom: Tool for women's empowerment." *American Journal of Public Health* 90(9): 1377-1381.

Klitzman, R. 1997. *Being Positive: The Lives of Men and Women With HIV* ISBN 1-56663-164-5; Ivan R. Dee, Publisher, 15200 NBN Way, Blue Ridge Summit, PA

Lewis, M. G. 2003. *AIDS: Women, men, empowerment, mobilisation*, VSO - Voluntary Service Overseas (UK), London, 53 pp

Myrick, R. 1996. *AIDS, Communication and Empowerment: Gay Male Identity and the Politics of Public Health Messages* ISBN: 1-56023-884-4; The Haworth Press, Inc.,

Nazeema, A., Alan j., Catherine, F., Wanjiru M., and Shahieda J. 2009. *HIV education in South African schools: The dilemma and conflicts of educators* *Scandinavian Journal of Public Health* 37(Suppl 2): 48-54

Nichols, J.E., Speer, D.C. Watson, B. J. et al 2002. *Aging with HIV: Psychosocial, Social, and Health Issues*. San Diego: Academic Press, Inc.

Ober, A.J., Iguchi, M.Y., Weiss, R.E., Gorbach, P.M., Heimer, R., Ouellet, L.J., Shoptaw, S., Anglin, M.D., Zule, W.A. 2011. *The Relative Role of Perceived Partner Risks in Promoting Condom Use in a Three-City Sample of High-Risk, Low-Income Women*. *AIDS and Behavior*, 15 (7):1347-1358.

Pettifor, A. E., D. M. Measham, et al. 2004. "Sexual power and HIV risk, South Africa." *Emerg Infect Dis* 10(11): 1996-2004.

Richter, L. 2004. The impact of HIV/AIDS on the development of children. In Pharoah, R. (Ed.) *A generation at risk: HIV/AIDS, vulnerable children and security on Southern Africa*. Pretoria, Institute of Security Studies.



Shaeffer, S. 1994. *The Impact of HIV/AIDS on Education. A Review of Literature and Experience.* Paris, UNESCO. Document available online

Shelley, G., Janice G., and Warren A., 1995. *Forgotten Children of the AIDS Epidemic* Yale University Press

Shetty, A. K. & Powell, G. 2003. *Children orphaned by AIDS: A global perspective.* Seminars in Pediatric Infectious Diseases, 14, 25-31.

Stillwater, E. 2006. *AIDS and the Ecology of Poverty*, Oxford University Press.

Suzanne L. G. 2006 *The Greater Involvement of People Living with and Affected by HIV and AIDS (GIPA): NGO Experiences and Implications for the Work of Oxfam International and Oxfam Australia*, July 2006, 50 pp.

UNAIDS 2006. Report on the Global AIDS Epidemic. New York, UNAIDS. Document available online

UNICEF 2007. *Caring for Children affected by HIV and AIDS*. Florence, UNICEF. Document available online

Visser, M. J., Schoeman, J. B. & Perold, J. J. 2004. Evaluation of HIV/AIDS prevention in South African schools. *Journal of Health Psychology*, 9, 263-280.

Wolf, B. 1996. *HIV Positive*. ISBN: 0-925190-99-3 The Haworth Press

## **2. Summary of the proposed revisions.**

1. Objectives – the course objectives were revised from the original syllabus of record and aligned with the Expected Undergraduate Student Learning Outcomes (EUSLO) and Common Learning Objectives found in the criteria for a non-laboratory Natural Science course.
2. Common Learning Objectives for a non-laboratory Natural Science course are met in the content portion of the course (not necessarily a specific revision but it should be noted that the objectives for the new curriculum have been met). These objectives are:
  - examine a body of knowledge of natural science that will contribute to an understanding of the natural world and an appreciation of the impacts that natural sciences have on the lives of individuals and the world in which they live
  - understand the differences between science as a knowledge base and science as a process that generates knowledge
  - develop an inquiring attitude consistent with the tenets of natural science
  - understand the empirical nature of science

- understand the concept of bias and the efforts to which scientists go to avoid it
3. Updated non-textbook reading to a more current book. Note: there are no newer textbooks on this subject (merely updates)
  4. Updated suggested readings with more current publications (11 of 15 readings).
  5. Added several more current citations to the bibliography.
  6. The language of the prerequisites and the catalog description was changed to clearly reflect the fact that this is a Liberal Studies offering in biology.

### **3. Justification/Rationale for the revision.**

The course is a currently approved Liberal Studies Non-Laboratory Natural Science course and is being revised to meet the new curriculum criteria for this category.

### **4. Old syllabus of Record**

#### **Syllabus BIOL 117 Understanding HIV Biology and**

**AIDS** 3 credits 3 lecture 0 lab (3c-01-3sh)

An introduction to the AIDS virus in which the mode of infection, transmission, and prevention are used as an illustration of biological principles. Profiles biological indicators for HIV disease and its progression to AIDS. Therapeutic and non-therapeutic approaches to treat HIV infections are emphasized.

#### **Objectives:**

As a result of this course

1. students will gain familiarity with common scientific terms in biology that effectively apply to understanding biological principles
2. students will be able to describe important biological characteristics of the retroviruses
3. students will be able to evaluate the common and uncommon modes of transmission of the virus
4. students will be able to recognize the risk(s) involved in unsafe sex and effectively demonstrate an understanding about the ways to prevent transmission
5. students will be able to explain how immune systems function and predict opportunistic infections in immune -suppressed individuals

6. students will be able to demonstrate an understanding on future prospects of experimental biological research to contain HIV transmission
7. students will be able to utilize important values to make informed decisions about AIDS-related issues as they develop in future

### **Lecture Topic Outline**

This sequence is based on three one-hour lectures a week for 14 weeks for a total of 42 lectures

### **Tentative Lecture Schedule**

#### **Topics**

**Introduction:** Discovering the Disease Naming the illness

AIDS a Disease or a Syndrome; AIDS Epidemic

Defining the illness: AIDS surveillance

**Concepts** of infectious disease; History of Epidemics

Factors that influence spread of an epidemic.

Koch's Postulates

The Human Immunodeficiency virus (HIV)

Sex and HIV

Evidence that HIV causes AIDS

HIV does NOT cause AIDS

#### **Immune Systems**

Basic immune system terminology and mechanism.

Human lymphocytes: T-Cells and B-Cells

Antibodies and HIV Disease

HIV and Immune Systems

#### **Virology and HIV**

Origin of AIDS Virus

Biological warfare

A virus from the Cats and Old World Green monkeys

UFO's

Retroviral genome of HIV

Genetic stability of HIV

HIV mutations and sources of variants

Why do some HIV-infected persons live so long?

#### **OPPORTUNISTIC INFECTIONS; CANCERS;**

**And CLINICAL MANIFESTATIONS ASSOCIATED WITH**

**HIV infections**

Tuberculosis, Fungal diseases

Viral diseases, Protozoa diseases  
 Bacterial diseases, Kaposi's sarcoma  
 Cervical carcinoma

### **THERAPY FOR HIV DISEASE**

General concept for antimicrobial therapy:  
 treatment vs cure (Is there a cure?)

Antibody-based Approach, Protease inhibitors

**Vaccine development** (Is there a vaccine?)

Ideal properties of effective vaccine

Combination drug AIDS therapy

**Non-Vaccine Treatments:**

### **A PROFILE OF BIOLOGICAL INDICATORS FOR HIV DISEASE AND PROGRESSION TO AIDS**

HIV disease defined

Stages of HIV disease: Asymptomatic stage,

Chronic stage, AIDS stage

Features of HIV pathogenesis

Potential mechanisms of viral entry,

Production of HIV- specific antibodies

Infection of the Central Nervous System

Clinical indicators to AIDS diagnosis

### **EPIDEMIOLOGY and AIDS**

**IN THE US, ASIA, and AFRICA**

### **PREVALENCE OF HIV INFECTION AND AIDS**

### **CASES IN THE UNITED STATES**

Risk groups and AIDS cases

Preventing HIV infections

Health care workers

Childbearing women

Testing: Who should get tested?

What does positive test mean?

Detection of HIV infection in newborns

Global patterns of HIV transmission and prevalence  
 of HIV infection and AIDS

AIDS epidemics in Asia, Africa, and the Latin America

Economics of preventing HIV infection in developing  
 countries

### **EXAM 1**

### **TRANSMISSION OF THE HUMAN IMMUNO-DEFICIENCY VIRUS**

Common modes of transmission HIV

Casual transmission

Transmission in household settings

Is HIV transmitted by insects or other vectors  
 HIV in blood  
 HIV in genital fluids  
 HIV in saliva and other body fluids  
 Sexual transmission of HIV  
 Maternal-child transmission of HIV  
 Home care prevention  
 Non-casual transmission  
 Unsafe Sex and HIV transmission  
 HIV infection among women

### **TERM PAPER DUE**

### **PREVENTING HIV TRANSMISSION**

Quarantine principles and practices

Barrier to HIV infection

How do I protect myself?

Safer sex

Education

### **RISK ASSESSMENTS**

WHO role in alternative barrier protection

Prevention of injection drug use

Blood and Blood product transmission

Blood collection and blood screening for HIV

Blood transfusion-associated HIV infection

Is blood safe?

Infection control procedures

### **Global Strategy to combat the spread of HIV and AIDS**

Living with AIDS : Human Dimension

Living with AIDS : Societal Dimension

Future Direction in combating AIDS

**Methods of Evaluation:** A student's final grade is a reflection of performance in the lecture exams; class quiz/participation; poster presentation and term paper. Your grade in the course HIV Biology and AIDS will be composed of three parts-----

#### **A. Examinations**

There will be several exams during the course. Exams will be a mixture of multiple choice, definitions, short answers, and essay questions. They will be in the form of quizzes and long exams.

#### **B. One Term Paper**

Students will be required to write a (10-12 standard double-spaced typed pages) term paper on ONE aspect of HIV or AIDS. In order to maximize student interest, students will be allowed to select topics on related themes. The term paper will be worth approximately 20% of the final grade. There will be a rigid format to which the students must strictly adhere. The instructor will meet with the

individual students and together define a term paper topic within the area of special interest. The early deadline requires students to survey the text, literature, internet links, and web sites on related topics soon after the semester begins.

The term paper is expected to demonstrate the author's ability to synthesize material from various sources and to think critically about scientific data.

Students will write a rough draft of the term paper and submit it to the instructor about 6 weeks after the semester begins. The instructor will hold an individual conference with each student to discuss the rough draft and make suggestions for revision. In its final form, the term paper is to resemble a scientific review article with correct grammar usage, punctuation and spelling as well as scientific terminology.

Copies of **All** Internet articles and other resources must be submitted with the paper. **No** resources with the paper will result in 0 for the paper.

**C. Poster Presentation** (work in pairs)

Students will maintain a portfolio of articles, and relevant information published (during the semester course is being offered) that are directly related to HIV and AIDS. These articles could be collected from variety of sources including clippings from newspapers, news magazines, internet, and other popular health journals. The information will be presented in the form of a poster. The poster will be evaluated for the theme selected, content, and quality of presentation.

**Course Grade:**

Four lecture exams will count as 60% of your overall grade, and will consist of the following exams and possible points.

Quizzes at least 5	x 20 points each	=	100 points
Long lecture Exam	1 x 100 points	=	100 points
<b>1 Comprehensive Final</b>	<b>x 100 points</b>	<b>=</b>	<b>100 points</b>
Poster Presentation		=	100 points
Term Paper		=	100 points)

The overall grade for the course will be derived from a combination of lecture exams (200 points), quizzes (50 points) poster presentation (100 points), and term paper scores (100 points). The final letter grading will be based on a straight percentage scale.

**Final letter grade:** A = 90% and above      B = 80% - 89.0%    C = 69% - 79.0%  
D = 59% - 69.0%    F = below 59.0%

**TEXTBOOK**

**ACQUIRED IMMUNE DEFICIENCY SYNDROME** by Gerald J. Stine, 4th Edition 1999, Prentice Hall, Englewood Cliffs, New Jersey 07632.

**SUGGESTED NON-TEXTBOOK READINGS****ONE OF THE FOLLOWING**

- \*1. **The Gender Politics of HIV/AIDS in Women: Perspectives on the pandemic in the United States.** 1997. Nancy Goldstein, Jennifer Manlowe, Nancy Goldstone.
- \*2. **Healing HIV: How to rebuild your immune System.** 1998. Jon D. Kaiser.
- \*3. **Gendered Epidemic: Representation of Women in the Age of AIDS.** 1998. Nancy Roth, and Katie Hogan.

**READINGS ON THE EVOLUTION AND ECOLOGY OF HIV AND AIDS**

**The AIDS Knowledge Base.** Little, Brown and Co. 1995. P. Cohen, M. Sande and P. Volberding.

**History of AIDS: Emergence and Origin of a Modern Pandemic.** 1993. Mirks D. Grmek, Russell C. Mantiz, and Jacalyn Duffin.

**Guns, Germs, and Steel.** Norton, 1997. Jared Diamond

**The Social Impact of AIDS in the United States.** National Academy Press, 1993. Albert R. Johnson, and J. Stryker.

**AIDS: The Burdens of History.** University of California Press, 1988. Elizabeth Fee and Daniel M. Fox.

**The Mirage of Health.** Doubleday, 1959. Rene Dubos.

**Man Adapting.** Yale University Press, 1965. Rene Dubos.

**AIDS and HIV Related Diseases: An Educational Guide.** 1996. Josh Powell, Amy Bourdeau.

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## **BIBLIOGRAPHY**

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- Senechek, D., and Koelling, J. (1997). Placing AIDS and HIV in Remission: A guide to Aggressive Medical Therapy for People with HIV Infection.

## **INTERNET LINKS AND SELECTED WEB SITES**

### UNAIDS

AIDS: News Online Background Briefing

National Institute of Allergies and Infectious Diseases

Center for AIDS Research, University of Alabama

AIDS Web

WWW AIDS Virtual Library

Center for AIDS Prevention Studies

HIV/AIDS Global Information System

<http://medstat.med.utah.edu/webPath/TUTORIAL/AIDS?HIV.html>

[www.thebody.com/aawh/force/aawh10.html](http://www.thebody.com/aawh/force/aawh10.html)

[www.thebody.com/aawh/force/aawh13.html](http://www.thebody.com/aawh/force/aawh13.html)

[www.thebody.com/cdc/livinh.html](http://www.thebody.com/cdc/livinh.html)

[www.cdc.gov/nchstp/hiv\\_aids/pubs/facts/perinatl.htm](http://www.cdc.gov/nchstp/hiv_aids/pubs/facts/perinatl.htm)



**Understanding HIV Biology and AIDS****BIOL 117. Understanding HIV Biology and AIDS****3c-01-3cr****Prerequisites: Non-Biology department majors and minors only**

**An introduction to the AIDS virus in which the mode of infection, transmission, and prevention are used as an illustration of biological principles. Profiles biological indicators for HIV disease and its progression to AIDS. Therapeutic and non-therapeutic approaches to treat HIV infections are emphasized. (Does not count toward Biology Electives, Controlled Electives, or Ancillary Sciences for Biology majors and minors.)**

### Answers to Liberal Studies Questions

- A. Not applicable. A single instructor will teach the course.
- B. The majority of contributions by women in the field of HIV and AIDS have come in the late 1990's in the form of public health awareness and education— Specifically, the course will discuss impact of HIV and AIDS on women and girls and the importance of getting tested for HIV; HIV sexual risk behavior among low-income women experiencing intimate partner violence: the role of posttraumatic stress disorder. In addition, several non-textbook readings are by women. Finally, three of the four case studies will incorporate women and minorities as part of the study.
- C. The students will be required to read one of the following books: *AIDS Science and Society*; *AIDS in the Twenty-First Century: Disease and Globalization*; and *HIV and Social Work: A Practitioner's Guide (Psychosocial Issues of HIV/AIDS)*. These books will provide a different approach for students than the lectures by describing how HIV and AIDS are viewed by various cultures throughout the world. These books primarily focus on various aspects of the disease viewed globally.
- D. This is an introductory course. It differs from our non-majors beginning courses (General Biology I) by focusing on one theme – HIV Biology and the disease rather than the entire realm of biology. In addition, the General Biology I course does not cover any viruses, immunology or circulatory system.

**Case Study 4 (5% of grade)**

1. Read the following article.
2. Answer the following three questions:
  1. What is the HIV prevalence among young women in South Africa (age group of 15 to 24)
  2. What biological and non-biological factors influence susceptibility to HIV infection among young women in South Africa? **What are the barriers to Treatment and Care?**
  3. **What is the role of** Lack of male circumcision in HIV spread in South Africa?
4. Based on this review how would you relate HIV spread in US population?

**Grading Rubric:**

1% - You gave no (or very little) observations, background material or what you gave was inappropriate to support your answer.

2% - You gave some observations and background material, but it is either too little, incorrect, or didn't provide a context for your answers.

3-4% You provided observations and background material that provide a context for your answers.

This is a paper from Muula, S.A. 2008. HIV Infection and AIDS Among Young Women in South Africa Croat Med J. June; 49(3): 423–435.

Young women in South Africa are at great risk of being infected with HIV. In 2005, HIV infection prevalence in the age group 15-24 years was 16.9% in women and 4.4% in men. The high HIV prevalence in this country is a result of a number of factors which include the following: poverty, violence against women, cultural limitations that promote intergenerational sex, non-condom use and preference for "dry sex," political factors and challenges that possibly prevented an aggressive response against HIV, recreational drug use, and biological factors such as high prevalence of sexually transmitted infections (STI). This essay will present and discuss the prevalence of HIV among young women in South Africa and the reasons for such a high prevalence in the country. I will also give an overview of the intervention programs that are currently under way with an aim to reduce the vulnerability of young women in South Africa. Finally, I will suggest what further interventions need to be provided in order to prevent and control HIV spread in South Africa and other southern African countries.

**HIV prevalence among young women in South Africa**

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HIV prevalence among young women aged 15 years to 24 years in South Africa is estimated at between 15 to 25 percent. HIV prevalence of about 4 to 6% among young

men, although high in comparison with Western countries, is still lower than the prevalence among women .

#### Prevalence of HIV infection among South African 2 years or older in 2005\*

Although there is high HIV prevalence among young women, the distribution is not uniform across the country. Kleinschmidt et al (2) have reported that lowest levels of infection are found in inland rural areas of the Western Cape and the highest in northwestern parts of KwaZulu Natal, southern Mpumalanga, and eastern Free State. The major metropolitan areas of Johannesburg and Cape Town have intermediate levels of between 7 and 11%.

Attempting to explore the factors that are associated with high HIV prevalence among South African young women is a daunting task, mostly because of the following reasons:

- a) Research may examine only a limited scope of factors. For instance, studies designed to explore the role of individual-level determinants of infection (eg, lifetime number of sexual partners, concurrent partners, history of STIs) may not give due recognition to group-level factors, such as percentage of the population living in poverty within a community, racial distribution,, the role of legislation on intimate partner violence, contraceptive use, or availability of health services;
- b) limitation in access to communities: much of the studies conducted in South Africa have been conducted in large metropolitan zones or at least in settings which are easily accessible;
- c) contradictions arising from studies reporting different effect estimates and different key factors important in the transmission of HIV in a particular setting. For instance, in most of Africa, there is evidence that education level of an individual may be associated with the risk of HIV infection. However, education may be an important factor in one setting but not in another, or the effect of education as an explanatory factor may change over time in the same setting (depending on the stage of the epidemic, a factor such as education may have different associations), or a variable may be measured differently from study to study. For instance, when education is the main variable some studies measure the number of years of schooling completed while other study measure the level of education attained. Certainly, these two measurements may not always measure the same constructs.
- d) data on potential confounding variables may not be available from studies conducted in South Africa. It is not always possible to have available data on all aspects of HIV that may potentially affect HIV transmission. For instance, data on injecting drug use in many parts of Africa are lacking. This does not necessarily mean that the practice does not contribute to HIV transmission in these settings. So if injecting illicit drug use and men having sex with men facilitate HIV spread in South Africa, the extent of their contribution to HIV spread is not fully known, as these behaviors are not often studied.

Despite these limitations and potentially many other, there is still a need to explore the “risk factors” of HIV infection and transmission in South Africa, a country which has the largest number of HIV infected persons in the world – an estimated 5 500 000 (95% confidence interval; 4 900 000-6,100,000).

### **Biological susceptibility to HIV infection among young women**

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High efficiency of HIV transmission from men to women is seen in in South Africa. There are reports that, contrary to previous findings, many HIV infected young women in South Africa had not had significantly more sexual partners than women of similar age in the developed nations. Mean number of lifetime sexual partners was 2.3, but HIV infection prevalence was 21.2%. In many developed countries, infection prevalence estimates are below 1% . Although the results by Pettifor et al may have been affected by under-reporting, there is no reason to believe that South African women would under-report more than the women elsewhere. The finding that many HIV-infected South African young women reported relatively low-risk sexual behaviors is not unusual. A report by Moyo et al suggests that young people who were in a relationship for at least a year and had sex in the past month were less likely to have used condoms consistently. HIV-infected women in North Carolina reported that a third of them did not report any known “high risk” behaviors.

The high HIV man to woman transmission rate may be a manifestation of the efficiency of the male “transmitter” and the susceptibility of the woman. Sexually transmitted infections in a male sex partner are important facilitators of HIV transmission. Furthermore, the immature cervix of the young female is particularly susceptible to the entry of HIV. Other biological factors that have been studied and possibly modulate the susceptibility of young women are the use of hormonal contraceptives, pregnancy, and abnormal vaginal flora.

South African women may be exposed to HIV infection due to the following reasons: limited treatment opportunities for sexually transmitted infections; young women having sex with young men who are likely to have recent infection; and high pregnancy rates. McPhail et al surveyed 3618 sexually active young women, 52% of which reported the use of contraceptives in the last 12 months. However, no definitive conclusion has been reached regarding the role of contraception and HIV transmission.

### **The role of the CCR gene**

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In the past several years, there has been a growing interest in genetic factors that may help to explain the large differences in HIV prevalence between Africa as opposed to Europe and North America. This resulted in a search for possible genetic differences among races; although race-ethnicity itself is a social and not genetic construct (14). The CCR5 gene, relatively more common among Caucasians but almost not present among people of African descent, has been suggested to partly be responsible for the differences in HIV prevalence between Africa and Europe and North America (15-18). Iqbal et al (19) have postulated that the protection from HIV infection in sex workers in Nairobi, Kenya, may be explained by the CCR5 gene. However, the CCR5 gene is not

that prevalent even among Caucasians and so its role in the epidemic nature of HIV transmission in southern Africa remains unclear.

### **Poverty and low status of women**

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Poverty, both at the individual and the societal level, has been associated with HIV prevalence (20-23). Poor neighborhoods do not have the necessary social infrastructure, which may promote HIV spread. Poor individuals, due to lack of alternatives for earning a livelihood, may be more likely to engage in sex work or other forms of transactional sex. Lopman et al (24) have reported that HIV prevalence is lower among higher socio-economic classes in that country. As a consequence of Apartheid and the associated racial segregation and discrimination, many South African young women, especially black ones are not educated. Their earning potential within the job market is, therefore, compromised. South Africa has high rates of poverty and unemployment (almost 40% of unemployed).

Transactional sex has been associated with high risk of HIV acquisition in both the developing and developed nations. The most common nationally representative survey of sexual behaviors and HIV infection is the Demographic Health Survey, which is conducted periodically with funding from the United States Agency for International Development of ORC Macro (Maryland) and developing nations' governments. Survey respondents are simply asked whether men have either provided money or material resources to their non-marital partner. Women are also asked whether they have received money or material gifts from a sexual partner. Any person who reports "yes" to this question is classified as having offered or obtained transactional sex.

Transactional sex has consistently been associated with a high risk of sexually transmitted infections and HIV. While "transactional sex" may be also understood as sex work from the western standpoint, some reports from Africa suggest that exchange of money and material resources may be a different cultural practice have been reported in Tanzania, committed sexual partnerships among youth are associated with the expectation that the male will provide material and financial resources to the female partner. The ability of the male partner to provide financial and material resources affects both the duration and the exclusivity of the relationship.

WHO has also explored the role of money transfers among youth in a rural southern district of Malawi. This author found that monetary transfers were expected in male-female sexual relationships. Women were described as gauging the marriage potential of a prospective partner by assessing how much money transfers he was able to make. On the other hand, young men perceived such women as "gold diggers" and not really committed to marriage.

Despite the fact that there are forms of transactional sex that may not carry higher HIV transmission potential, in general though, transactional sex is more likely to be associated with risk behavior. An individual is less likely to insist on "safer sex" when if she or he were to benefit materially or financially from the sexual transaction. Transactional sex is also associated with casual sex and concurrent sexual

partnerships, which are then associated with high likelihood of HIV transmission. The power imbalance that may exist between the person providing the money and the person receiving the money facilitates HIV transmission, since partners are not selected on the basis on criteria other than money.

### **The role of migrant labor**

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The role that labor migration has played in the spread of HIV in Southern Africa has been discussed elsewhere. During the Apartheid period, South Africa had been a major recipient of migrant labor from neighboring countries such as Zimbabwe, Botswana, Swaziland, and even from Zambia and Malawi. Some authors have also described the process of “circular migration” where individuals cycle through urban and rural areas in search of jobs in urban areas and living a subsistence livelihood in rural areas. South African authors have ascribed the spread of HIV to and from South Africa to the way migrant labor camps were run. Adult men (laborers) that are employed in the mines are confined to migrant labor camps. Men are not allowed to come to the mines with their spouses, so a vibrant sex industry and an environment that encourages men having sex with men are probably created. This has at least three important implications. First, the men would transmit HIV and other sexually transmitted infections to their sex partners back home during their holidays or upon the return. Second, these men would also bring sexually transmitted infections acquired in their homeland to the migrant labor camps. Finally, disturbed sex ratios may stimulate the relationships with multiple and concurrent partners and transactional sex. Labor migration within South Africa, where mostly men leave their rural areas in search of employment in urban areas is probably a main driver of HIV spread in South Africa . Migrant labor movement still continues in South Africa, as people work in large farms and in the mines.

### **Intergenerational sex**

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Some have reported that dissortative sex, ie, sexual partnerships between individuals from high risk and from low risk groups (mixing of risk groups) is an important driving force of the HIV epidemic. This is contrasted to assortative sexual mixing, ie, sexual partnerships between individuals of similar HIV risk, which would not foster the spread of HIV.

Intergenerational sex, where young women have sex with older men (more than 5 years age difference), is one of the different forms of dissortative sex. Young people, who have had less exposure to sex, are sexually connected with adults, whose HIV infection rates are likely to be higher.

The mechanisms by which inter-generational sex may facilitate HIV transmission are as follows: there is likely to be significant power differentials when the ages of the partners are so much different; condoms are less likely to be used in these relationships; likelihood of HIV discordancy at start of relationship likely to be high.

Research on intergenerational sex suggested that all intergenerational sex is associated with power imbalances, no condom use, manipulation, poverty and the sheer need for

economic survival. While such factors may be at play in many intergenerational partnerships, exceptions do exist. Nkosana and Rosenthal's qualitative research showed that some relationship between young girls and older men were associated with desire for pleasure, enjoyment and sense of equal partnership by the younger partner. However, young women involved in such kind of relationship may fail to appreciate the precarious nature of such relationships.

High risk intergenerational sex may also occur when older men, who know they are infected with HIV, seek unprotected sex with younger women or children. In South Africa, and many parts of southern Africa, there is a belief that having sex with a virgin is a cure for HIV. The extent to which such practices could be driving the HIV epidemic in South Africa is likely to be small though.

### **Violence against women and rape**

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Violence against women, and especially rape, are significant problems in South Africa, where it is estimated that more than one woman is raped each second. There are reports that representative community-based surveys have found that among women in the 17-48 age group, there were 2070 such incidents of rape per 100 000 women per year. Compared to consensual sex, rape is a rare event. However, the fact that rape is unsolicited, and is likely to be unsafe (no condom use, tears), makes it an important aspect of the HIV transmission in South Africa. The risk of HIV infection may be minimized by the provision of drug prophylaxis, which may not be readily available, especially in remote rural parts of South Africa.

### **Lack of male circumcision**

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From the mid 1980s, evidence has been accumulating that male circumcision could be associated with lower transmission of HIV. Countries with high prevalence of circumcision are also likely to have lower prevalence of HIV infection. However, most of these studies were cross-sectional and, therefore, could not estimate causation. Therefore, randomized controlled trials were conducted in Orange Farm (South Africa), Kisumu (Kenya), and Rakai (Uganda). These studies have demonstrated a protective efficacy of circumcision against HIV acquisition among men of about 60%.

South Africa's male circumcision prevalence is below 30% and the majority of men were traditionally circumcised as a rite of passage from childhood into adulthood. Circumcision protects against HIV acquisition potentially through many mechanisms, as has been discussed elsewhere. In brief however, the reduced surface area of potential exposure to HIV, the prevention of sexually transmitted diseases (other than HIV), and the keratinization of the glans penis are all postulated as mechanisms through which circumcision prevents HIV transmission among men. In a community where men are less likely to be infected with HIV (as a consequence of circumcision) women are also likely not to be infected. The fact that a small percent of men in South Africa is circumcised could at least in part explain the high HIV prevalence among women.



There is already interest to provide circumcision to adolescents and young men in South Africa in order to prevent HIV transmission. These issues include the age of circumcision, consent and assent issues, safety of the procedure within a health system with limited supplies and human resources, and stigma that may be associated with circumcision.