

INSTRUCTOR'S NAME AND COLLEGE NAME

VANDANA SRIVASTAVA, PITT COMMUNITY COLLEGE, GREENVILLE, NC

COURSE TITLE AND NUMBER

BRIEF CALCULUS, MAT 263

MODULE TITLE

RATE OF CHANGE OF POPULATION: GROWTH AND DECLINE

DESCRIPTION OF MODULE

Students will be introduced to the concept of **rate of change** in the beginning of the sixteen week semester. Students will research, collect, organize and analyze the data pertaining population growth and decline in different parts of the world. In particular, students will study the rate of change of population and analyze population growth and decline over the years 1950-2005 in intervals of 5 years.

OBJECTIVES

1. Students will connect mathematical concepts with real world issues.
2. Students will actively participate and learn about different countries.
3. Students will analyze population data choosing two different countries from two different continents.
4. Students will explore various reasons for population growth or decline
5. Students will compare and contrast their findings.
6. Students will plot graphs of their findings (rate of change of population) and model the data with increasing, decreasing, constant or piecewise functions.
7. Students will project **population trends** for the future.

METHODOLOGY

Lectures/Discussions:

All mathematical concepts and relevant models will be provided in the class room. Students will be assigned a number of routine exercises from the text book to enable a working knowledge of the concept and applications of **rate of change**.

Audio-Visuals Teaching Aids:

Students will be provided the opportunity to view the examples of the kind and quality of the work expected out of them during the class. White board, overhead projector and power point presentation will be used for this purpose.

Countries likely to be examined:

Africa: Botswana, Egypt, Kenya, South Africa, Uganda, Zambia

Asia: China, India, Russia, Japan

Europe: Germany, France, Italy

South America: Brazil,

Additional countries may be added as needed.

Assignments:

Students will analyze the population data over the time period 1950 – 2005 in intervals of 5 years and study the rate of change. The students will then plot the rate of change and draw conclusions about “population trends”. The students should explore any mitigating reasons for population decline (such as famine, disease, war, etc.) during a time specific time interval.

The students will analyze population data from one country each from two different continents besides North America. The students will compare their findings.

The written and oral reports must include

1. Brief introduction to the countries (minimum of 100 words)
2. Actual population data
3. Computation of rates of change
4. Graph of rates of change
5. Conclusion about population trends and possible reasons

Time Line for tasks(for a sixteen(16) week course) :

Week 2: Deadline for approval of countries

Week 4: Deadline for submission of draft of country introduction and data

Week 7: Deadline for submission of draft of data analysis, rate of change graph and conclusions.

Week 8: Deadline for submission of first draft of the complete project.

Week 13: Deadline for submission of final draft of the complete project.

Oral classroom presentations (including power point) will tentatively take place during the last three weeks.

Evaluation:

The module will be evaluated on a scale of 0 to 100 points.

1. Submission of tasks by deadline: 5 pts x 5 = 25 pts (Failure to submit a task on time will result in 0 points for that specific task. Note: Task two cannot be submitted before task one, etc..)

2. Final Written report: 50 points

Introduction of countries: 5 + 5 = 10 pts

Data of countries: 5 + 5 = 10 pts

Analysis and Graph: 8 + 8 = 16 pts

Conclusion and supporting arguments 7 + 7 = 14 pts

50 points

3. Oral Presentation: 25 points

Power point slides (Content and presentation) = 10 pts

Oral presentation = 10 pts

Average of Peer Grade = 5 pts

25 points

RESOURCES

Data :

1. www.census.gov/ipc/www/idb/ranks.html
2. <http://faostat.fao.org/site/544/default.aspx>

Readings:

The Environmental Literacy Council: Population

<http://www.enviroliteracy.org/article.php/1368.html>

Sarah Yang , Economic stress in Germany linked to decline in male births

http://berkeley.edu/news/media/releases/2003/09/16_stress.shtml

Julian Chapple, The Dilemma Posed by Japan's Population Decline
<http://www.japanesestudies.org.uk/discussionpapers/Chapple.html>

Gilles Pison, Will AIDS lead to a population decline in sub-Saharan Africa?
http://www.ined.fr/fichier/t_publication/499/publi_pdf2_pop_and_soc_english_385.pdf

Jean-Claude Chesnais, The Inversion of the age pyramid and the future population decline in France
<http://www.un.org/esa/population/publications/popdecline/Chesnais.pdf>

Antonio Golini, Possible policy responses to population ageing and population decline: the case of Italy.
<http://www.un.org/esa/population/publications/popdecline/Golini.pdf>

World Overpopulation Awareness: Population implosion, graying of population, population reduction, and negative population growth
<http://www.overpopulation.org/older.html>

Macmillan Encyclopedia of Death and Dying
<http://www.encyclopedia.com/doc/1G2-3407200230.html>

Russia Faces Depopulation? Dynamics of Population Decline, Population & Environment, Vol. 23, No. 5, May 2002, pg. 437-464, Springer Netherlands

Encyclopedia of Population, Editors: P. G. Demeny and G. McNicoll, Macmillan Reference Books, May 2003

Additional current journal, magazine or newspaper articles will be assigned, if necessary.