George Mason University
Graduate Course Approval/Inventory Form

Please complete this form and attach a copy of the syllabus for new courses. Forward it as an email attachment to the Secretary of the Graduate Council. A printed copy of the form with signatures should be brought to the Graduate Council Meeting. Complete the Coordinator Form on page 2, if changes in this course will affect other units.

Please indicate:  __X__ NEW    ____ MODIFY    ____ DELETE

Local Unit: SCS  Graduate Council Approval Date:

Course Abbreviation: EOS  Course Number: 704

Full Course Title: Spatial Analysis and Modeling of Population

Abbreviated Course Title (24 characters max.): Population Modeling

Credit hours: 3  Program of Record: ESS M.S. and CSI Ph.D.

Repeatable for Credit?  ___ D=Yes, not within same term  Up to hours
___ T=Yes, within the same term  Up to hours
  __ X__ N=Cannot be repeated for credit

Activity Code (please indicate):  __ X__ Lecture (LEC)  ___ Lab (LAB)  ___ Recitation (RCT)
___ Studio (STU)  ___ Internship (INT)  ___ Independent Study (IND)  ____ Seminar (SEM)

Catalog Credit Format 3: 3: 0  Course Level: GF(500-600)  ___ GA(700+)  __X__

Maximum Enrollment: 20  For NEW courses, first term to be offered: Fall 2005

Prerequisites: Courses in quantitative methods and GIS are recommended

Catalog Description (35 words or less): An intermediate level population geography course discussing demographic concepts and spatial dimensions of population. Various indices, measures, and models commonly used in human geography will be featured.

For MODIFIED or DELETED courses as appropriate:
Last term offered:  Previous Course Abbreviation:  Previous number:

Description of modification:

APPROVAL SIGNATURES:
Submitted by:  ________________________________ email: ________________
Department/Program:  ________________________________ Date: __________________
College Committee:  ________________________________ Date: __________________
Graduate Council Representative:  ________________________________ Date: ________________
GEORGE MASON UNIVERSITY  
Course Coordination Form

Approval from other units:

Please list those units outside of your own who may be affected by this new, modified, or deleted course. Each of these units must approve this change prior to its being submitted to the Graduate Council for approval.

<table>
<thead>
<tr>
<th>Unit:</th>
<th>Head of Unit’s Signature:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graduate Council approval: ___________________________ Date: __________

Graduate Council representative: ___________________________ Date: __________

Provost Office representative: ___________________________ Date: __________
Course Proposal to the Graduate Council  
by  
The School of Computational Sciences

1. COURSE NUMBER AND TITLE:

EOS 704 Spatial Analysis and Modeling of Population

Prerequisites: Courses in quantitative methods and GIS are recommended.

Catalog description: An intermediate level population geography course discussing demographic concepts and spatial dimensions of population. Various indices, measures, and models commonly used in human geography will be featured.

2. COURSE JUSTIFICATION

Course objectives: This is an intermediate level population geography course focusing on the techniques and models used to analyze human population. These techniques and models are commonly used in geography, and specifically in population geography. Students are expected to acquire knowledge concerning demographic concepts; techniques used to quantify and analyze the spatial distribution of population; and models utilized to understand and interpret population growth and migration. Selected topics will include demographic measures and statistics; various indicators of population distribution (such as centrographic, accessibility, and segregation measures); and models used to analyze migration (including markov chain and spatial interaction models).

Course necessity: Currently, there is no graduate level course in human geography introducing basic models and techniques appropriate for human geography studies and population analysis.

Course relationship to Exiting Programs: This course will serve as a core course for the geography students in the proposed Ph.D. in Earth Systems and GeoInformation Sciences. It will be cross-listed as a geography course in the near future. It will serve as an elective course for students in the ESS M.S. and Geography M.S. programs.

Course relationship to Other Existing Courses: There is no similar course in SCS, CAS (Geography) or SPP. EOS 304/GEOG 304 is an undergraduate course on population geography focusing on general facts and some conceptual issues, while the proposed course focuses more on the techniques and models applicable to this topic. In addition, GEOG 581 World Food and Population has a focus on food production in relation to population, but it does not address the analytical or spatial techniques and models used to quantify population characteristics. SPP also has courses addressing regional economics and development models, but none of them have a population orientation.

3. APPROVAL HISTORY

4. SCHEDULING AND PROPOSED INSTRUCTORS

Time of initial offering: Fall 2005

Proposed instructors: Dr. David Wong

5. TENTATIVE SYLLABUS: See attached.
The study of population is important because many issues and problems occurring on Earth are somehow related to humans. People are not distributed evenly across the Earth’s surface, and people in different places are distinct. This course will review demographic concepts and provide students with an understanding of the spatial aspects of population. It will also include discussion of the various spatial analytical techniques and spatial models that are used to study different aspects of population, such as the accessibility index or the various segregation measures. Examples include the utilization of Markov chains to model population changes and the application of spatial interaction models to the study of population spatial dynamics. Exposure to these and other ideas will allow students to enhance their comprehension of the analysis of population issues/problems. Both descriptive and analytical techniques will be covered. The use of computational tools and Geographic Information Systems (GIS) are expected.


**Major Reference:**


**Evaluation Criteria:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 exercises</td>
<td>30</td>
</tr>
<tr>
<td>Mid-term</td>
<td>20</td>
</tr>
<tr>
<td>Final</td>
<td>25</td>
</tr>
<tr>
<td>Term Paper or Project</td>
<td>25</td>
</tr>
</tbody>
</table>

Approximate grade distribution: 10-20% (A), 20-35% (B), 40-60% (C), (D) and (F)???.

* 10% of the score for each day will be deducted if assignments are late.

* All materials submitted to meet the evaluation criteria should be done in accordance with the student Honor Code (University Catalog).

**Incomplete** will be handled strictly according to the University policy. Make-up exams are not given unless under unusual circumstances such as serious illness. Proof (documentation) is necessary to be eligible for make-up exams. No early exams will be given. **Final exam: Dec …?**

**Office hours:** 3-4:00pm, T in S&T I 205 or by appointment (dwong2).
**Major Topics:**

**Introduction**
- Importance of Population Geography

**Data Sources, Internet Resources, Census Geography (PL: 2; PR: 1.6)**
- International
- United States
- Census and Census Geography (US)
- SFs, PUMS, and American Community Survey
- Auxiliary data
- Remote Sensing

**Demographic Characteristics (static to dynamic)**
- Age and Sex Structure
- Race and Ethnicity
- Mortality and Fertility
- Population Growth: history and modeling
- U.S. demographic structure
  (Ex.1 Analysis of U.S. demographic characteristics)

**Spatial Distribution of Population**
- Distribution at the Global Scale
- Urban Geography
- Measures of Population Distribution
- Segregation and Integration
- Location Quotient
  (Ex. 2 Spatial Analysis of Population)

**Dynamics of Population: Mobility/Migration**
- Theories of migration
- International migration
- Regional migration
- Spatial Interaction Models
- Intraurban migration
- Residential Choice Models
  (Ex. 3 Modeling of migration)