Course Description
IN 282. Artificial Intelligence Game Programming. 3 hours credit. This course will enable the student to develop programs including techniques to read, write, and manipulate data. The student will learn to visualize game data with a focus on reporting, charting, and analyzing the results. The student will use predictive analytics techniques such as machine learning and data mining to predict probable outcomes.

Required Materials
For complete material(s) information, refer to: http://www.bookstore.butlercc.edu

Supplemental Materials
A computer capable of installing data analysis software.

Butler-assessed Outcomes
The intention is for the student to be able to
1. Design, develop, and test machine learning programs.

Learning PACT Skills that will be developed and documented in this course
Through involvement in this course, the student will develop ability in the following PACT skill area(s):

Analytical Thinking Skills
- Critical thinking - Through debugging code, the student will utilize critical thinking skills in troubleshooting logic problems.

Personal Development Skills
- Personal management – By utilizing the time lines set on various projects, the student will develop time management skills while working on major projects within the course.

Technology Skills
- Discipline-specific technology – Through review of key concepts of programming structure, exploration of database management, and machine learning, the student will increase their technology skills.

Major Summative Assessment Task(s)
These Butler-assessed Outcome(s) and Learning PACT skill(s) will be demonstrated by:
1. Completing a machine learning program with a database.

Skills or Competencies
These actions are essential to achieve the course outcomes:
1. Use machine learning to develop data science algorithms.
2. Use analytic tools to develop programming skills.
3. Develop data handling concepts.

Learning Units
I. Python
   A. Python overview
   B. Programming overview
   C. Introduction to Integrated Design Environment (IDE).

II. Elements of high-quality programs
    A. Data types
    B. Rules of programming
    C. Modularization and inheritance
    D. Software and Agile development

III. Data scientist
     A. Data science basics
     B. Role of data scientist

IV. Big data
    A. Collection
    B. Query

V. Analytics tools
   A. Selection
   B. Types
   C. Common mistakes

VI. Analytics software
    A. Matplotlib
    B. Pandas
    C. NumPy

VII. File handling and applications
     A. Computer files and data hierarchy
     B. File handling in scenarios

VIII. Data handling concepts
      A. Data import
      B. Data manipulation algorithms

IX. Clustering
    A. Clusters
    B. Hiding, cohesion, and coupling
    C. Statistical clustering for big data

X. Data dictionary
A. Define a data dictionary
B. Build a data dictionary
C. Decision trees

XI. Game design
   A. Principles of game design
   B. Storyboarding

**Learning Activities**
The student will engage in discussions, communicate with students and participate in portfolio presentations. Instruction will be in the form of lecture, video, group work, and modeling. These activities may be either face-to-face or online.

**Grade Determination**
The student will be graded on learning activities and assessment tasks. Grade determinants may include the following: daily work, quizzes, chapter or unit tests, comprehensive examinations, projects, presentations, class participation, and other methods of evaluation at the discretion of the instructor.