COURSE TITLE: Differential Equations
COURSE NUMBER: MAP 2302

COURSE DESCRIPTION (with prerequisites):
This course is an introductory course in ordinary differential equations. Topics covered are linear first-ordered equations and their applications, methods for solving non-linear differential equations, second order equations, Wronskians, power series solutions, methods of undetermined coefficients, LaPlace transforms, and Fourier series solutions. Prerequisite or corequisite: MAC 2313. 3 semester hours.

NAME(S) OF INSTRUCTORS:
Dr. Lou Cleveland, Dr. Irma Cruz-White

EFFECTIVE ACADEMIC YEAR:
2014-15

REQUIRED TEXTBOOKS AND INSTRUCTIONAL SUPPLIES:

GRADING POLICY:
The standing of a student in each course is expressed by one of the following letters and corresponding grading system:
A – 90 – 100
B – 80 – 89
C – 70 – 79
D – 60 – 69
F – 59 or less
The Chipola Catalog provides policies and procedures regarding the grading system. A student’s Grade Point Average is derived from the grading system/quality point scale.

ATTENDANCE AND WITHDRAWAL POLICIES:
Chipola College expects regular attendance of all students. Students who are absent from classes for any reason other than official college activities must satisfy the instructor concerned that the absence was due to illness or other clearly unavoidable reasons. Otherwise, the student may suffer grade loss at the discretion of the instructor. Chipola policy allows each instructor to specify in the Instructor First Day
Handout whether or not an absence is excusable and what affect the absence or tardy may have on the grade.

A student is allowed to repeat a course a maximum of three (3) times. **On the third attempt a student (1) must bear the full cost of instruction (unless waived by Student Services), (2) cannot withdraw, and (3) must receive a grade.**

**MAKE-UP POLICY:**
Chipola allows each instructor to specify in the Instructor First Day Handout the makeup policy.

**ACADEMIC HONOR CODE POLICY:**
Students are expected to uphold the Academic Honor Code. Chipola College’s Honor Code is based on the premise that each student has the responsibility to (1) uphold the highest standards of academic honesty in his/her own work; (2) refuse to tolerate academic dishonesty in the college community; and (3) foster a high sense of honor and social responsibility on the part of students. Further information regarding the Academic Honor Code may be found in the Chipola Catalog, Student Governance section.

**STUDENTS WITH DISABILITIES POLICY:**
Chipola College is committed to making all programs and facilities accessible to anyone with a disability. Chipola’s goal is for students to obtain maximum benefit from their educational experience and to effectively transition into the college environment. Students with disabilities are requested to voluntarily contact the Office of Students with Disabilities to complete the intake process and determine their eligibility for reasonable accommodations.

**LIBRARY AND ON-LINE REFERENCE MATERIALS:**
The library is a comprehensive learning resource center providing information in print, electronic, and multimedia format to support the educational objectives of the College. On-line catalogs, e-books and electronic databases can be accessed by using the LINCCWeb icon on the Chipola Library website at [www.chipola.edu/library](http://www.chipola.edu/library). If you have questions about database usage consult the “How to Use the Chipola Databases” on the Library website or call the Library at 850/718-2274 during regular hours. Library hours are posted each semester at the building entrance and on the Library website. See your Instructor First Day Handout for individual instructor recommendations and resources.

**TECHNOLOGY RESOURCES:**
The college’s learning management system is Canvas. Classes become available on Canvas on the first day of the semester. It is the student’s responsibility to log onto the Canvas system the first day of class to establish the first day of attendance and to check announcements. All official class communication must be through Canvas. For further information, contact your instructor or the Director of eLearning. The Canvas support hotline is available online in live chat and on the phone, toll-free, at 855-308-2812 for any issues in accessing or utilizing Canvas. The Information Technology
Center, located in the library, is equipped with computer workstations. Lab hours are posted each semester at the building entrance and on the Library website.

**TUTORING RESOURCES:**
Chipola College has contracted Smarthinking, a Pearson Company, for online tutoring services, accessible especially from 5 p.m. to 8 a.m. It can be accessed through Canvas. Additionally, the Academic Center for Excellence (ACE) Lab, located in Building L, offers free tutoring from 8 a.m. to 5 p.m. and is equipped with computer workstations. Lab hours are posted each semester at the room entrance.

**ELECTRONIC DEVICE USAGE:**
All electronic devices such as cell phones, beepers, pagers, and related devices are to be silenced prior to entering classrooms and/or laboratories to avoid disruption. Should it become necessary for a student to leave his/her “device” on to send or receive an emergency call and/or text message, the student must inform the instructor prior to class. If the student finds it necessary to send and/or receive an emergency call and/or text message during class/lab time, he/she is instructed to take all books and belongings and step outside the classroom to deal with the situation. To minimize classroom disruption and the distraction to classmates, the student will not be permitted to reenter the classroom during that class period. Any time a test is being administered, all such devices must be turned off and put away. If a device is seen or heard during an exam, a score of zero will be given for that exam. Initial and repeated infractions may result in disciplinary action.

**DISCIPLINE SPECIFIC COMPETENCIES / LEARNING OUTCOMES:**
Demonstrate Basic Mathematical Skills and Knowledge

M-1 Apply arithmetic, algebraic, or geometric skills to solve mathematical problems.

M-2 Represent basic mathematical information verbally, numerically, graphically, or symbolically.

M-3 Use technology to solve mathematical problems.

M-4 Interpret mathematical models such as formulas, graphs, tables and schematics.

M-5 Use mathematical processes in solving real world applications.

**MAP 2302 is not a General Education core course and therefore a student in MAP 2302 will demonstrate selected learning outcomes from this list.**
### LINKING COURSE-LEVEL STUDENT LEARNING OUTCOMES WITH DISCIPLINE-SPECIFIC COMPETENCIES, ASSESSMENT METHODS, AND ARTIFACTS

<table>
<thead>
<tr>
<th>COURSE-LEVEL STUDENT LEARNING OUTCOMES FOR MAP 2302</th>
<th>DISCIPLINE-SPECIFIC GENERAL EDUCATION COMPETENCIES</th>
<th>ASSESSMENT METHODS FOR COURSE LEVEL STUDENT LEARNING OUTCOMES</th>
<th>ARTIFACTS FOR AA PROGRAM ASSESSMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Perform operations on matrices and use matrices to solve linear equations.</td>
<td>M-2</td>
<td>UT, F, Obs., H</td>
<td>No artifact will be submitted for program assessment as MAP 2302 is not a course with general education credit.</td>
</tr>
<tr>
<td>• Classify and solve first order linear equations.</td>
<td>M-1, M-2, M-4, T-1</td>
<td>UT, F, Obs., H</td>
<td></td>
</tr>
<tr>
<td>• Use explicit methods of solving higher-order linear differential equations.</td>
<td>M-1, M-2</td>
<td>UT, F, Obs., H</td>
<td></td>
</tr>
<tr>
<td>• Solve differential equations using LaPlace transforms.</td>
<td>M-1, M-2</td>
<td>UT, F, Obs., H</td>
<td></td>
</tr>
<tr>
<td>• Use Approximate methods of solving first-order equations.</td>
<td>M-1, M-2, M-3, M-4, T-1</td>
<td>UT, F, Obs., H</td>
<td></td>
</tr>
<tr>
<td>• Use Series solutions to solve linear differential equations.</td>
<td>M-1, M-2</td>
<td>UT, F, Obs., H</td>
<td></td>
</tr>
<tr>
<td>• Apply methods of solving differential equation to real world problems.</td>
<td>M-1, M-2, M-4, M-5</td>
<td>UT, F, Obs., H</td>
<td></td>
</tr>
</tbody>
</table>

**Assessment Codes**

T = Tests  
Pre/Post = Pre- and Post-Tests  
OT = Objective Tests  
UT = Unit Tests  
Q = Quizzes  
F = Final Examination  
CF = Cumulative Final  
EX = Departmental Exam  
SE = Nat’l or State Standardized Exam  
RPT = Report/Presentation  
SP = Skills Performance  
SD = Skills Demonstration  
W = Writing Assignments  
E = Essays  
DE = Documented Essays  
RP = Research papers  
J = Jury  
R = Recital  
Proj. = Projects  
Exp. = Experiments  
Cap. Proj. = Capstone Project  
Cap. Course = Capstone Course  
Prac. = Practicum  
Intern. = Internship  
H = Homework  
PS = Problem Solving  
DB = Discussion Board  
BO = Behavioral Observation  
Clin. = Clinicals  
CS = Case Study  
CP = Case Plan  
Port. = Portfolio  
Obs. = Teacher Observation  
Sk. Check = Skills Check-off  
Curriculum Frameworks  
JP = Judged  
Performance/Exhibition

### MEANS OF ACCOMPLISHING STUDENT LEARNING OUTCOMES:

Students will accomplished these objectives of this class through information gained from teacher lead discussion, computer simulations, guided classroom work and graded homework assignments.

### ASSIGNMENT AND/OR COURSE OUTLINE

See your Instructor First Day Handout for individual instructor assignment schedule.