

DEREE COLLEGE SYLLABUS FOR:									
MA 2235 CALCULUS I (Summer 2019)	US CREDITS: 3/1/3								
PREREQUISITES:	MA 1108 College Algebra								
CATALOG DESCRIPTION:	An introductory course in differential and integral calculus. Topics include transcendental functions and their properties, the derivative concept and rules of differentiation, properties and applications of the derivative including graph sketching, optimization problems, implicit differentiation. Also, integration and the Fundamental Theorem of Calculus, integration techniques including parts, trigonometric substitution, and partial fractions; introduction to vectors, functions of several variables and partial differentiation.								
RATIONALE:	A course in mathematics that offers an introduction to calculus and its basic techniques, necessary for calculus-based science and engineering courses.								
LEARNING OUTCOMES:	<ol style="list-style-type: none"> 1. Demonstrate understanding of the concepts of differential calculus and find the derivative of univariate functions. 2. Apply differentiation rules to solve approximation and max-min problems with application in sciences and interpret the results. 3. Demonstrate understanding of the concepts of integral calculus and evaluate the indefinite and definite integral of univariate functions. 4. Make use of integration to solve problems with application in sciences and interpret the results. 5. Demonstrate understanding of the concepts of vector analysis and partial differentiation. 								
METHOD OF TEACHING AND LEARNING:	<p>In congruence with the teaching and learning strategy of the college, the following tools are used:</p> <ul style="list-style-type: none"> ➤ Classes will consist of lectures where the concepts of the course will be introduced. Coursework will be regularly assigned and discussed in class with students actively participating in the discussion. Computer software will be available both as a teaching aid and as the medium for solving problems. ➤ Office hours: students are encouraged to make full use of the office hours of their instructor, where they can ask questions, see their exam paper, and/or go over lecture material. ➤ Use of a blackboard site, where instructors post lecture notes, assignment instructions, timely announcements, as well as additional resources. 								
ASSESSMENT:	<p>Summative:</p> <table border="1"> <tbody> <tr> <td>Midterm Examination</td> <td>40%</td> </tr> <tr> <td>Final Examination</td> <td>50%</td> </tr> <tr> <td>Math Portfolio Assessment</td> <td>10%</td> </tr> </tbody> </table> <p>Formative:</p> <table border="1"> <tbody> <tr> <td>In-class examination</td> <td>0%</td> </tr> </tbody> </table> <p>The formative, a 1-hour in-class examination, aims to prepare students for the examinations.</p> <p>The midterm examination is a 1-hour common examination. Learning outcomes 1, 2</p> <p>The final examination is a 2-hour common and comprehensive examination. Learning outcomes 1, 2, 3, 4, 5</p> <p>The math portfolio assessment is available through digital assessment tools accompanying the course textbook and aims to demonstrate the level of understanding of the course's learning outcomes.</p>	Midterm Examination	40%	Final Examination	50%	Math Portfolio Assessment	10%	In-class examination	0%
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INDICATIVE READING:	<p>REQUIRED READING:</p> <p>Ron Larson, Bruce Edwards, <i>Calculus: Early Transcendental Functions</i>, Cengage, © 2019, 7th Edition (International Metric Edition, e-book)</p> <p>RECOMMENDED READING:</p> <ul style="list-style-type: none"> • Instructor's hand-outs. • Books on reserve in the library. • Robert Smith, Roland Minton, <i>Calculus</i>, McGraw Hill, © 2011, 4th Edition. • Sophie Goldie, Roger Porkess, <i>Pure Mathematics 2 and 3</i>, Cambridge International AS and A Level Mathematics-Hodder Education ©2012
JOURNALS:	<p>RECOMMENDED MATERIAL:</p> <ul style="list-style-type: none"> • College Mathematics • Mathematics Magazine • American Mathematical Monthly
COMMUNICATION REQUIREMENTS:	Verbal presentation skills using academic / professional English.
SOFTWARE REQUIREMENTS:	Any software distributed with the course textbook.
WWW RESOURCES:	<p>http://en.wikipedia.org/wiki/Portal:Mathematics</p> <p>http://mathworld.wolfram.com</p> <p>http://mathacademy.com</p>
INDICATIVE CONTENT:	<ol style="list-style-type: none"> 1. Trigonometric Functions <ol style="list-style-type: none"> 1.1 Trigonometric functions and identities 2. Differentiation <ol style="list-style-type: none"> 2.1 The concept of the derivative as a limit 2.2 Basic rules of differentiation and rates of change 2.3 Higher order derivatives and the chain rule for composite functions 2.4 Implicit differentiation and related rates 2.5 Monotonicity and extrema of functions 2.6 Concavity and inflection points of functions 2.7 Optimization and linear approximations with differentials 3. Integration <ol style="list-style-type: none"> 3.1 Antidifferentiation: The indefinite integral and its basic rules 3.2 The definite integral and the Fundamental Theorem of Calculus 3.3 Integration by substitution 3.4 The natural logarithmic function and its integration 3.5 The inverse trigonometric functions and their calculus 3.6 The hyperbolic functions and their calculus 4. Integration Techniques and Applications <ol style="list-style-type: none"> 4.1 Modelling with separable first order differential equations 4.2 Area of a region between curves 4.3 Integration by parts 4.4 Trigonometric techniques of integration 4.5 Integration of rational functions using partial fractions 5. Vectors and the Geometry of Space <ol style="list-style-type: none"> 5.1 Vectors in the plane and in space 5.2 The dot product 5.3 The cross product 6. Functions of Several Variables <ol style="list-style-type: none"> 6.1 Functions of several variables 6.2 Partial derivatives