Course Specifications

General Information

Course name	Calculus (2)
Course number	MATH1321
Faculty	
Department	
Course type	College Needs
Course level	1
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

1 - study and recognize other important classes of functions as logarithmic functions, exponential functions and hyperbolic functions

2 - learn basic techniques of integration for functions with one variable

3 - be prepared to take more advanced courses in mathematics

4 - understand infinite series and their convergence and divergence criteria and know how they can be used in approximation techniques

5 - enable student to apply his knowledge to solve practical problems they encounter in phisical sciences and engineering

Intended Learning Outcomes

Knowledge and Understanding	* study and recognize other important classes of functions as logarithmic functions, exponential functions and hyperbolic functions
	* use integration by parts, trigonometric substitution, partial fraction to evaluate definite and indefinite integrals
	* define an improper integral and evaluate some classes of improper integrals by the concepts of limits, convergence and divergence
	* determine convergence or divergence of sequences and series
	* use Taylor and Maclaurin series to represent functions
	* use Taylor and Maclaurin series to integrate functions
Intellectual Skills	* develop and strengthen problem solving
	* understand concepts rather than mimic techniques
	* learn to think about problems mathematically and to solve problems independently
Professional Skills	* be able to state and explain basic calculus definitions and theorems
	* understand the relationship between the process and its corresponding inverse
	* understand the meaning and important applications of the concepts
	* have a clear understanding of the ideas of calculus as a foundation for subsequent courses in mathematics
General Skill	* hone the ability to do reality checks on calculations
	* become effective communicator and team player
	* learn to work together productively and learn to be cooperative
	* be able to communicate mathematics

Course Contents

1 - Logarithmic and Exponential Functions : invers functions- the natural logarithmic function - the natural exponential function - integration - general logarithmic and exponential functions

2 - Inverse Trigonometric and Hyperbolic Functions: inverse trigonometric functions- derivatives and integrals - hyperbolic functions - inverse hyperbolic functions

3 - Techniques of integration: integration by parts - trigonometric integrals - trigonometric substitutions - integrals of rational functions- integrals involving quadratic expressions - miscellaneous substitution

4 - ndeterminant forms and Improper Integrals: indeterminant forms and l Hopitals rule - integrals with infinite limits of integration - integrals with discontinous integrands

5 - Infinite Series: sequences - convergent or divergent series - positive term series tests- the ratio and root test - alternating series and absolute convergence- power series- power series representation of functions - Maclaurin and Taylor series- the binomial series

Teaching and Learning Methods

1 - lectures

2 - discussion

Students Assessment

Assessment Method	TIME	MARKS
first midterm exam	after 6 weeks of study	25%
second midterm exam	after 10 weeks of study	25%
final exam	at the end of the semester	50%

Books and References

Essential books	Calculus, fifth edition; Earl W. Swokowski; Pws-Kent Puplisher Company, 1991
Recommended books	Calculus with analytic geometry- Robert Ellis & Denny Guhick,1996 1996, Calculus- Thomas Finny; Addison-Wiesely Puplishing Company,Inc
Other References (Periodical, web sites, ... etc.)	all calculus books