Pure Mathematics

Course Code	PEU5300					
Level	05					
Course Title	Riemann Integration					
Credit value	3					
Core/Optional	Optional					
Prerequisites	PEU4301(Passed or Valid OCAM)					
Hourly breakdown	Theory		Practical	Independent Learning	Assessment	Total
	25*2= 50 hrs	DS hrs =4*3 = 12 hrs		25*3 = 75 hours Online learning = 11 hours	CA = 2 hrs	150 hrs
Course Aim/s.	1. Describe the meaning (logical) of the Riemann integral of a function on a closed and bounded interval 2. The meaning (logical) of the improper Riemann Integral of an unbounded function on a bounded interval or bounded function on an unbounded interval					
PLOs addressed by course	**PLO1: Knowledge:** Explain the fundamental, principles and broader knowledge pertaining to the chosen science disciplines offered for the degree. **PLO3: Communication**: Demonstrate the competency in communicating efficiently and effectively to present information, ideas and concepts to the scientific community as well as to the wider society. **PLO4: Individual Work, Team Work and Leadership**: Demonstrate the competency in working independently and in groups in addressing issues in multi-disciplinary environments and completing the tasks on time through collaborative learning while exhibiting leadership. **PLO5: Creativity and Problem Solving:** Identify and analyze problems using quantitative and/or qualitative approaches using scientific methodology to provide valid conclusions. **PLO9: Lifelong Learning**: Develop the capacity to foresee new trends and their impacts and continuously update knowledge and develop skills willingly to meet those future challenges.					
Course Learning Outcomes (CLO)	At the completion of this course student will be able to **CLO1**: find the integration of a function on a closed and bounded interval using Riemann integration technique (PLO1,3,4,5,9) **CLO2**: describe Riemann criterion to prove or disprove the Riemann integrability of a function (PLO1,3,4,5,9) **CLO3**: prove the Riemann integrability of a continuous/ monotonic function on a closed and bounded interval (PLO1,3,4,5,9) **CLO4**: solve some questions on integration using the Mean Value Theorem and Fundamental Theorem of Calculus (PLO1,3,4,5,9)					
Content (Main topics, sub topics)	Upper Sums and Lower Sums, The Upper Riemann Integral, The Lower Riemann Integral, Relations between the Upper Riemann Integrals and the Lower Riemann Integrals, The Riemann Integral, The Riemann's Criterion, Inequalities Involving the Riemann Integral, Integrability of Monotonic Functions, Integrability of Continuous Functions, Integrability of Composition of Functions, Algebra of Integrable Functions, Properties of the Riemann Integral, Differentiation and Integration, Evaluation of Integrals, Mean Value Theorems, The Integral as a Limit of Riemann Sums, Improper Integrals					
Teaching Learning methods (TL)	▪ Independent learning of Self :- study Instructional Material (IL) - Online Activities(OL); Reference Work (RF) ▪ Non—Compulsory contact sessions :- Day Schools (DS) ▪ Assessments (AS) and Feedback – MCQs (MCQ);Structured Essay (SEQ); Essay Questions (ES)					
Assessment strategy	Overall CA Mark (OCAM): 40%				Final Assessment: 60%	
	Details: Continuous Assessment1 (CAT1): -1hr Continuous Assessment2 (CAT2): -1hr OCAM = 60%of Maximum(CAT1, CAT2) + 40%of Minimum(CAT1, CAT2)				Final Evaluation -Theory: 100%-2hrs	
Recommended Readings:	• Ross, K. (2013). *Elementary Analysis*: *The Theory of Calculus* (*2ⁿᵈ Edition*). Springer Publishers. • Rudin, W. (2013). *Principles of Mathematical Analysis* (*3ʳᵈ Edition*). McGraw-Hill Publishers.					