

Course Code	PEU3301					
Level	03					
Course Title	Foundations of Mathematics					
Credit value	3					
Core/Optional	Core					
Prerequisites	PEU3300 (Pass / valid OCAM / CR)					
Hourly breakdown	Theory		Practical hours	Independent Learning	Assessments	Total hrs
	25 X 2 = 50 hrs	DS hrs = 4*3=12hrs		<ul style="list-style-type: none"> ▪ (25 x 3)=75 hrs ▪ Online /Audio-visual materials and other learning resources(11hrs) 	<ul style="list-style-type: none"> ▪ Continuous Assessments (CA)(2 hrs) 	
Course Aim/s.	Use the basic concepts of mathematics so that student will ready to follow undergraduate algebra and analysis courses.					
PLOs addressed by course	<p>PLO1: Knowledge: Explain the fundamental, principles and broader knowledge pertaining to the chosen science disciplines offered for the degree.</p> <p>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.</p> <p>PLO5: Creativity and Problem Solving: Identify and analyze problems using quantitative and/or qualitative approaches using scientific methodology to provide valid conclusions.</p> <p>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.</p>					
Course Learning Outcomes (CLO)	<p>At the completion of this course student will be able to</p> <p>CLO1: Use the meanings of two most basic words in mathematics, namely set and function to enhance students understanding of the algebraic structure of the foundations of mathematics(PLO 1,3,5, 9)</p> <p>CLO2: Use the properties of the algebraic, order and metric structures enjoyed by the real number system to enhance students understanding of the analytic structure of the foundations of mathematics. (PLO 1,3,5, 9)</p>					
Content (Main topics, sub topics)	<p>Algebraic structure: Sets, Algebra of Sets, Intervals and Cartesian Products, Order Relations, Zorn's Lemma, The Well-Ordering Theorem and The Axiom of Choice, Functions, Functions and Sets, Finite Sets and Infinite Sets, Countability, Order of Infinity.</p> <p>Analytic structure: Algebraic Structure of the Real Number System, Order Structure of the Real Number System, Solution of an Inequality, Integers and Rationals, Bounds, Maxima and Minima, Bounds, Sups and Infs, Completeness Axiom, The Archimedean Property, Irrational Numbers, Algebraic Numbers and Transcendental Numbers, Dense Subsets of \mathbb{Q} , Metric Structure of the Real Number System, The Distance Function, The Meaning of Limit of a Sequence, The Meaning of Sum of a Series.</p>					
Teaching Learning methods (TL)	<p>Self-Learning/Independent learning of Self-study</p> <ul style="list-style-type: none"> ▪ Instructional Material (IL) ▪ Online Activities (OL) ▪ Reference Work (RF) <p>Compulsory contact sessions</p> <ul style="list-style-type: none"> ▪ Assessments (AS) and Feedback – MCQs (MCQ); Structured Essay (SEQ); Essay Questions (ES) <p>Non-compulsory contact sessions</p> <ul style="list-style-type: none"> ▪ Day Schools (DS) 					
Assessment strategy	Overall Continuous Assessment Mark (OCAM): 40%		Final Assessment (FA): 60%			
	Details: Continuous Assessment1 (CAT1):- 1hr Continuous Assessment2 (CAT2):- 1hr OCAM=60%Maximum(CAT1, CAT2)+ 40% Minimum(CAT1, CAT2)		Final Evaluation-Theory: 100 %-2hrs:			
Recommended Readings:	<ul style="list-style-type: none"> • Apostol, T.M. (1974). <i>Mathematical Analysis (2nd Edition)</i>. Addison-Wesley Publishing Company. • Binmore, K.G. (1982). <i>Mathematical Analysis (2nd Edition)</i>. Cambridge University Press. • Ramasinghe, W. (2007). <i>Eelagha Padhaya</i>. Bon & Bickey Publications (written in Sinhala). • Ramasinghe, W. (2005). <i>Sankyawak Parimeya Weeme Sambhawithawa</i>. Bon & Bickey Publications (written in Sinhala). • Ramasinghe, W. (2009). <i>Usas Pela Ganitha Abyuhanaya</i>. Bon & Bickey Publications (written in Sinhala). 					