

*SLQF Course Profiles.*

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|--|---|------------------------------------|-----------------|--|--|--------------|
| <b>Semester and Level</b>                                    | Semester 2 - Level 05   |                                    |                 |  |  |              |
| <b>Course Code</b>   | ADU5319   |                                    |                 |  |  |              |
| <b>Course Title</b>  | Design and Analysis of Experiments  |                                    |                 |  |  |              |
| <b>Credit Value</b>  | 03  |                                    |                 |  |  |              |
| <b>Core/Optional</b>   | Open Elective Course  |                                    |                 |  |  |              |
| <b>Prerequisites</b>   | ADU3201/ADU3218/ADU5318 (Pass/ Valid OCAM/CR)   |                                    |                 |  |  |              |
| <b>Hourly Breakdown</b>                                      | Theory  |                                    | Practical hours | Independent Learning                                   | Assessments  | Total hours  |
|  | 25*2<br>= 50<br>hours   | DS<br>hours<br>4*3<br>=12<br>hours | —               | 25*3<br>= 75 hours<br><br>Online learning =<br>9 hours | CAT = 2 hrs<br>(OBT*1 hr) +<br>(NBT* 1 hr)<br><br>Final exam =<br>02 hrs | 150<br>hours |
| <b>Course Aim/s</b>  | State the basic concepts of design and analysis of experiments, apply various designs to real world problems and to follow advanced design courses.   |                                    |                 |  |  |              |
| <b>Programme Learning Outcomes (PLO) addressed by course</b> | PLO1: Knowledge<br>PLO2: Problem Analysis<br>PLO3: Investigating and Problem Solving<br>PLO4: Information and Communication Technology Literate<br>PLO5: Individual and Team Work<br>PLO6: Communication<br>PLO7: Lifelong Learning   |                                    |                 |  |  |              |
| <b>Course Learning Outcomes (CLO)</b>                        | After successful completion of this course, students should be able to: <ul style="list-style-type: none"> <li>▪ CLO1 : Explain basic concepts in experimental designs (PLO 1,6).</li> <li>▪ CLO2 : Explain the limitations of each analysis through consideration of assumptions (PLO 1,2,3,6).</li> <li>▪ CLO3 : Distinguish between different types of experimental designs (PLO 1,2,3,5,6).</li> <li>▪ CLO4: Apply theory and methods to a variety of applications and interpret results (PLO1,2,3,5,6,7).</li> <li>▪ CLO5 :Use the computer for analysis only after understanding how to perform the analysis manually (PLO1,2,3,4,5,6)</li> </ul> |                                    |                 |  |  |              |
| <b>Content (Main topics, Sub topics)</b>                     | Introduction to Experimental Designs, Need for Experimental Design, Structures of Experimental Designs, Completely Randomized Design, Independent Comparisons, Mean comparison with Confidence Intervals, Testing the effects suggested by data, Concept of Blocking, Randomized  |                                    |                 |  |  |              |

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|------------------------------------|---|---|
|                                    | Complete Block Design, Efficiency of Blocking, Two-way classification with N observations per cell, Randomized Blocks with sub sampling, Latin Square Design, Introduction to Factorial Experiments, $2^k$ factorial experiments, Yates 'Algorithm, General 3-Factor Experiments.         |   |
| <b>Teaching – Learning methods</b> | <ul style="list-style-type: none"> <li>▪ Self-learning/independent learning; printed course material activities/online supplemented component.</li> <li>▪ Non-compulsory contact sessions; 04 day schools.</li> <li>▪ Continuous Assessments (CA)</li> <li>▪ Final examination</li> </ul> |   |
| <b>Assessments Strategy:</b>       | Overall Continuous Assessment Mark (OCAM) -40%  | Final Assessment Mark(FEM)-60%  |
|                                    | For the two tests Open Book Test- OBT (1 hour) and the No Book Test- NBT (1 hour), if A is the maximum mark and B is the minimum mark, the OCAM mark will be computed as<br><br>OCAM=A(60%)+B(40%).<br><br>A student must obtain an OCAM of 35% or more to sit for the final examination. | Final Evaluation 2 hrs.<br><br>One theory paper with 6 structured and /essay type questions in which 4 to be answered.  |
|                                    | Overall Mark-“Z”%   | <p>If <math>Y \geq 40</math> <math>Z = 0.4X + 0.6Y</math>.</p> <p>If <math>30 \leq Y &lt; 40</math> then <math>Z = 0.4X + 0.6Y</math>, subject to a maximum of 40</p> <p>If <math>Y &lt; 30</math>, then <math>Z = Y</math></p> |
| <b>Recommended Readings</b>        | <ol style="list-style-type: none"> <li>1. Design and Analysis of Experiments (9<sup>th</sup> edition) by Montgomery Douglas</li> <li>2. Experimental Designs (2<sup>nd</sup> edition) by Cochran William G., Cox Gertrude M</li> </ol>  |   |