Current Course Code and Title	PAP742 Optical Design Theory
Details of Course	**Summary of course content** Review of geometric optics, Finite raytracing, paraxial systems, ideal systems, aberration theory, Seidel aberrations, correction of aberrations, lens design fundamentals, diffractive elements, aspherical and freeform design.
	Aims and objectives a. The ability to carry out simple paraxial optics calculations (image positions, magnification etc. b. An understanding of aberrations and their description in terms of Seidel coefficients. c. To identify and understand the inter-relation of Seidel aberrations, d. To practically use Seidel sums e. To understand the correction of primary aberrations f. To be able to design simple optical systems such as an achromatic doublet.
	Syllabus Fermat's Principle, Snell's law. Gaussian (paraxial) optics, stops and pupils, ray tracing, principal and marginal rays. Transverse ray and wavefront aberrations, the aberration polynomial, primary aberrations, Seidel aberrations, Forms of Seidel aberrations, Chromatic aberration, Special surface conditions, Thin lens parameters, Correction of field curvature, Correction of chromatic aberration, Thin lens aberrations, The achromatic doublet correction of spherical aberration, coma and chromatic aberration, Control of astigmatism, Spherical mirrors, Aspheric mirrors, Diffractive optical elements.
Assessment Please specify if components are individually assessed or group assessed	Continuous Assessment: 3 assessed problems: 60% (20% each, individual assessment) 1 design problem: 40% (group assessment)
	Total: 100 %
Hours of Contact/Academic Units	39 contact hours/ 3 AU
Instructor and Co-instructor (if any)	Peter Török, Aalim Khan
Class size	30
Academic Year and Semester/Trimester	August 2021 (To be offered once per academic year)