

Unit	AR20050	
	3 Credits	
	Assessment by Examination	
Unit Title	Lighting	
Aims	To provide a theoretical grounding that will enable students to tackle the range of lighting calculations likely to be encountered in practice in relation to the control of natural light through the building envelope.	
Objectives	To review the concepts of lighting units that were encountered in earlier courses and to extend them to include all units of measurement. To consider the theory used to calculate the transmittance of shading devices and the illuminances within rooms from natural lighting.	
Content	Lighting units	Radiation, Spectroradiometric curves, Laws of photometry, solid angle, projected areas, light flux, illuminance, luminous exitance, luminous intensity and luminance.
	Direct illuminance	Point sources, Polar curves, Flux from point sources, Extended sources.
	Sky illuminances	Uniform sky, CIE sky, construction of Waldram diagrams.
	Uniform luminance	Reflectance of real surfaces, equivalence of uniform diffuse sources, relationship between luminance and luminous exitance, unit hemisphere method, vector summation method, light streamlines.
	Flux transfer	Definition of form factor, mutual exchange coefficients, law of reciprocity of uniform diffuse sources, special reciprocity, form factor algebra.
	Inter-reflections	Assumptions employed, successive reflections, steady state exchange between surfaces, use in lighting, transmittance through shading devices, lighting simulation programs.
	Shading design	Sun position, The design of total exclusion shading masks.
	Combined Ltg.	Top up lighting, Permanent Supplementary Artificial Lighting Installations, Energy use through year.
	Control	Issues of control, energy strategies, comfort limits.