

INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
PROFORMA FOR NEW COURSE

1.	Title of the Course	Functional Design of Buildings
2.	Course Number	CE4103
3.	Status of the Course	Core
4.	Structure of Credits	2-0-0-2
5.	Offered To	UG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Civil Engineering
8.	To take effect from	July 2018
9.	Prerequisite	Nil
10.	Whether approved by the Department	Yes
11.	Course Objective: This course delivers a comprehensive understanding of the relationship between climate and the built environment. The course presents the functional aspects of buildings in relation to heat, light, wind, sound etc., and their influence on building design and performance. Further, the course introduces the fundamentals of green buildings and explores the importance of passive design strategies and their significance in energy savings.	
12.	Course Content: Components of climate - tilt of the earth, seasons; Solar radiation, humidity, wind, sky condition; Climatic classifications - hot humid, hot dry, cold, temperate, warm humid, composite; Sun path diagram - design of shading devices; Thermal comfort - human body heat balance, heat transfer in buildings, thermal properties, conductivity, resistivity etc., psychometric chart, comfort zone, bio climatic chart; Wind - generation of wind, Coriolis force, air change, stack effect, Venturi effect, evaporative cooling; Lighting - day lighting and electric lighting fundamentals and prediction methods; Acoustics - fundamentals, dB scale, octave band NC curve; Sound insulation - transmission and absorption, room acoustics - reverberation time.	
13.	Text book(s): 1. Koenigsberger O H, Ingersoll T G, Mathew A and Szokolay S V, <i>Manual of Tropical Housing and Building: Climate Design</i> , Universities Press (1975). 2. Szokolay S V, <i>Introduction to architectural science</i> , Taylor & Francis group (2008).	
14.	Reference(s): 1. Krishan A, Baker N, Yannas S and Szokolay S V, <i>Climate Responsive Architecture: A Design Handbook for Energy Efficient Buildings</i> , McGraw Hill Education (India) Private Limited (1999). 2. Givoni B, <i>Man, Climate and Architecture</i> , John Wiley & Sons (1998). 3. Egan M D, <i>Architectural Lighting</i> , McGraw-Hill (2002). 4. Allen E, <i>How Buildings Work</i> , Oxford University Press (2005).	