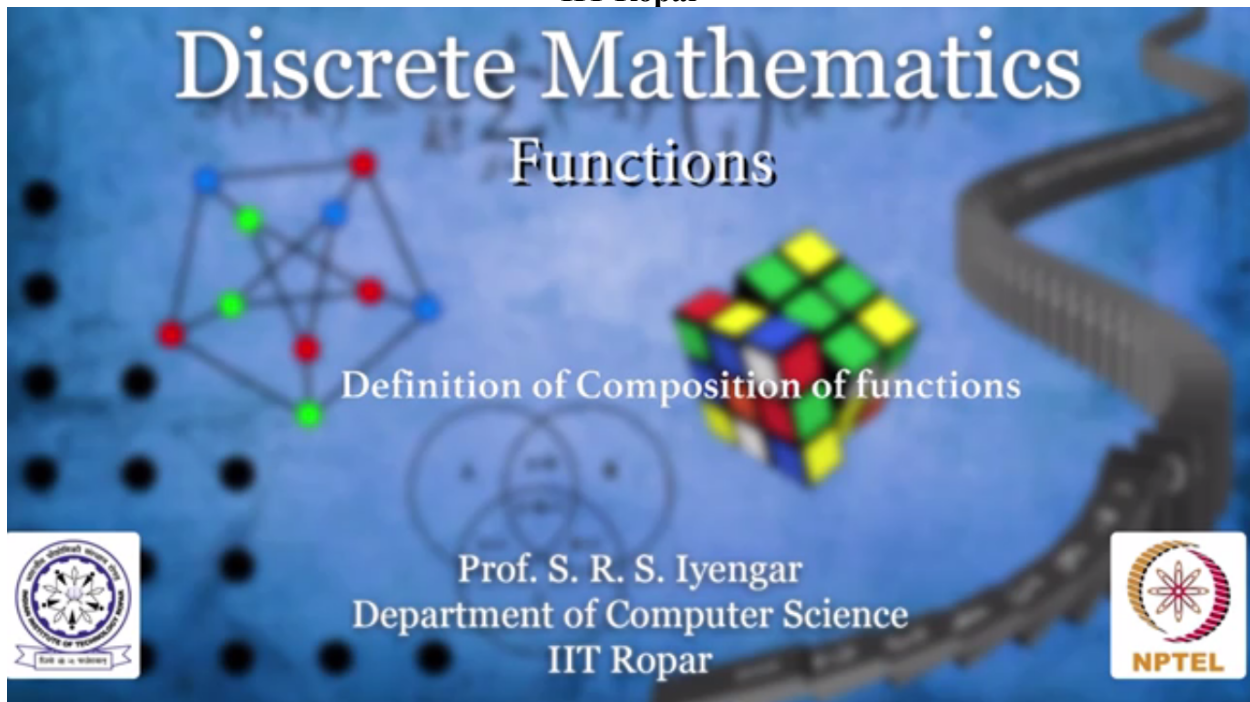


**NPTEL
NPTEL ONLINE COURSE**

**Discrete Mathematics
Functions**

Definition of Composition of functions

**Prof. S. R. S. Iyengar
Department of Computer Science
IIT Ropar**



A straightforward observation, slightly abstract, but still straightforward an observation. If f is a function from X to Y and g is a function from Y to Z , then $g \circ f$ will be a function from X to Z . Isn't that obvious? Let's see how.

f takes X to Y and g takes Y to Z and hence $g \circ f$, $g \circ f$ always means apply f first and then g next, is a function from X to Z . Right?

Observation :

IIT
Ropar

$$f: X \longrightarrow Y \quad g: Y \longrightarrow Z$$

$$g \circ f: X \longrightarrow Z$$

$$g \circ f = g(f(x))$$



Now note something, whenever you define g , you must define it properly. g cannot have values outside Y . It must have values within Y .

IIT Madras Production

Founded by
Department of Higher Education
Ministry of Human Resource Development
Government of India

www.nptel.iitm.ac.in

Copyright Reserved