NPTEL

NPTEL ONLINE CERTIFICATION COURSE

Discrete Mathematics
Graph Theory - 1

Subgraph

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Look at this friendship network between A, B, C, D, E and F,
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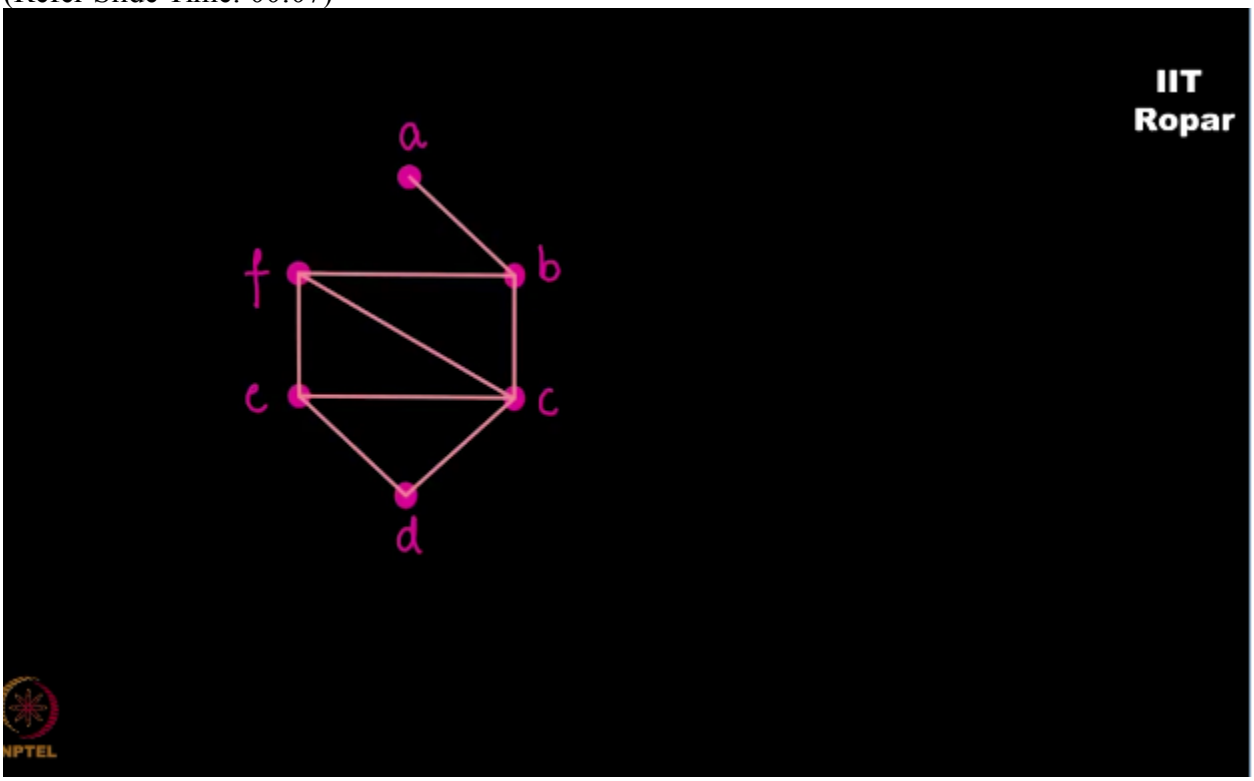

now let us take only these friends B, C, E, and F,
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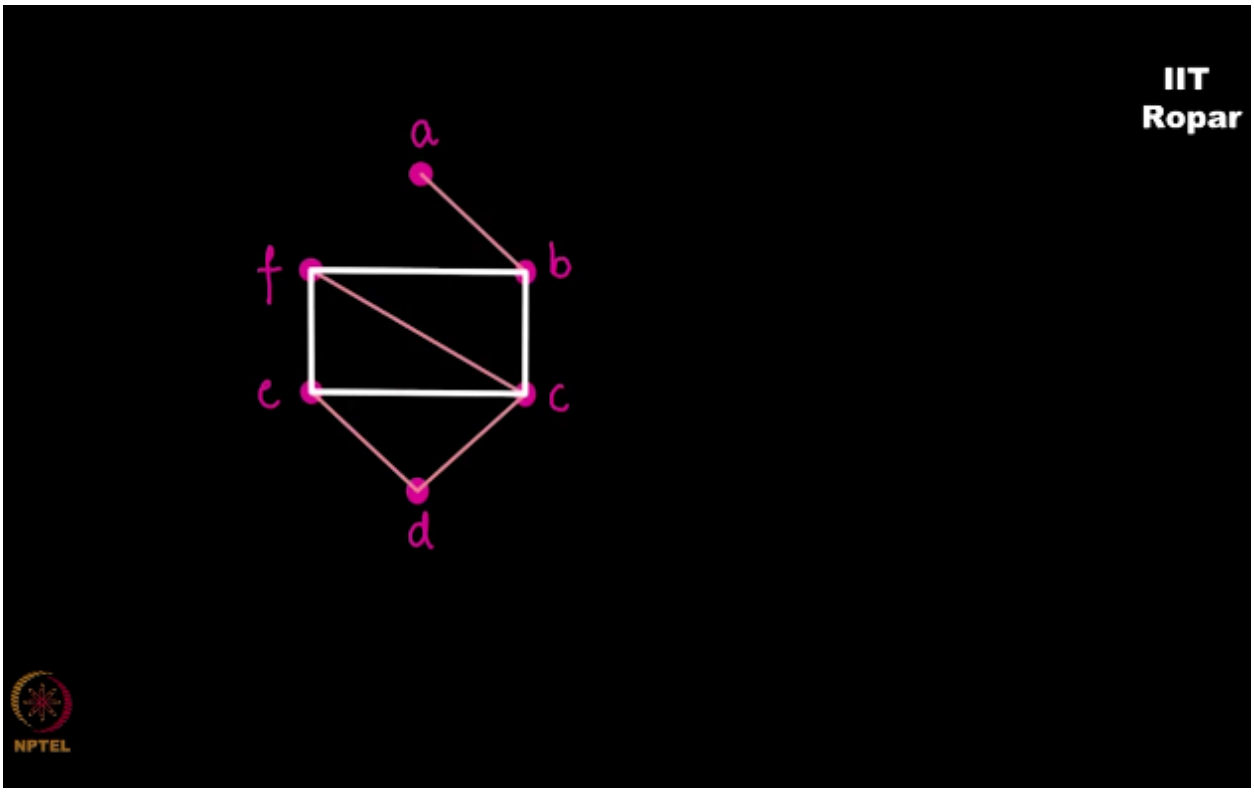

do you see a quadrilateral like friendship between B, C, E, and F, I'm removing the friendship between C and F also,

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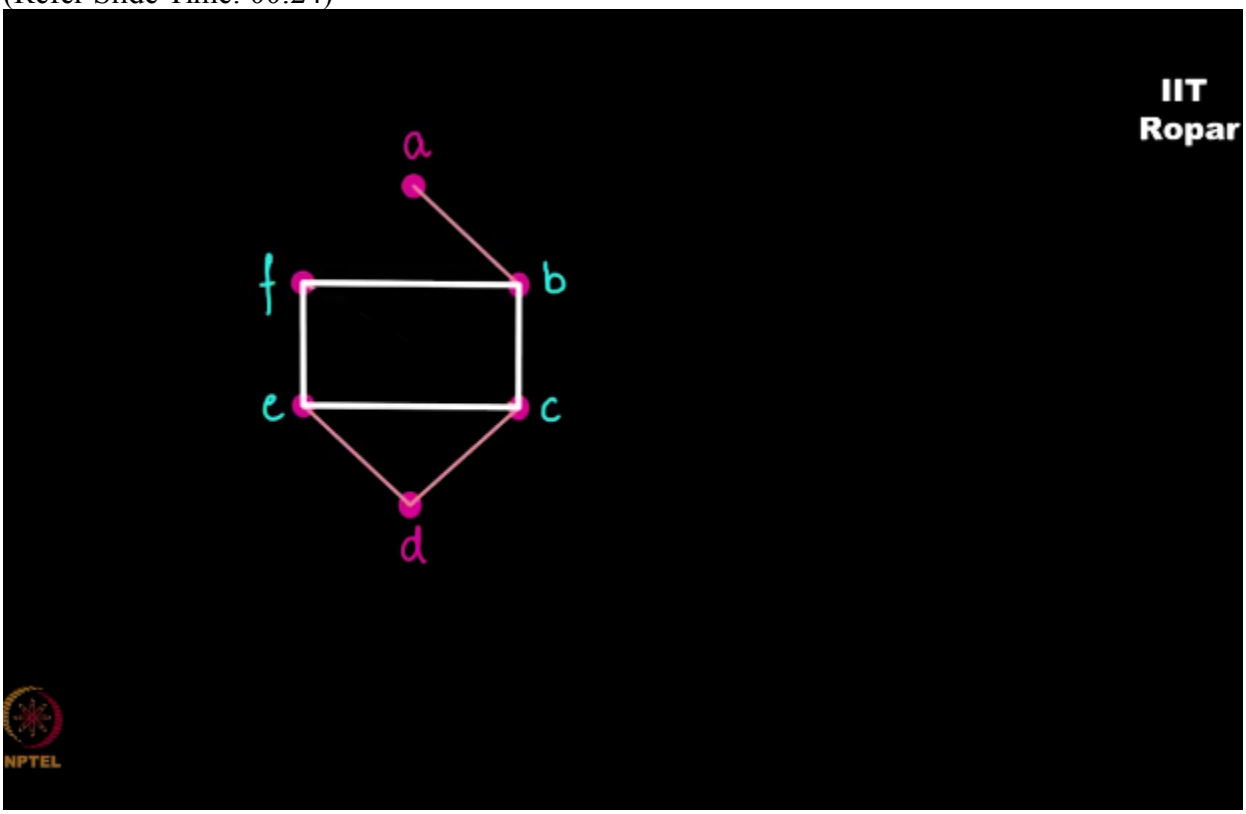

look at this graph the original graph, and a subgraph of the original graph,
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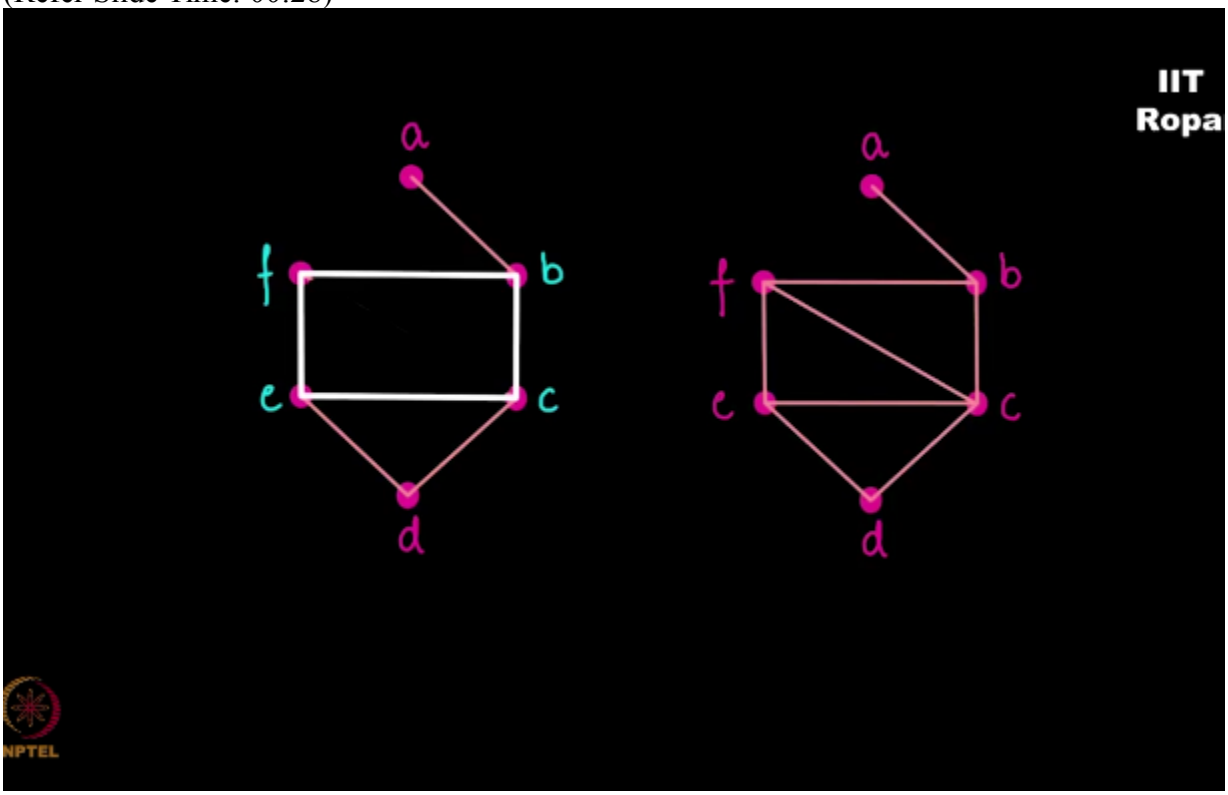

this is more like a subset, okay.

Do you see that a subgraph has subset of the vertex set and subset of the edge set, such a graph is formally defined as a subgraph. Now in the subgraph
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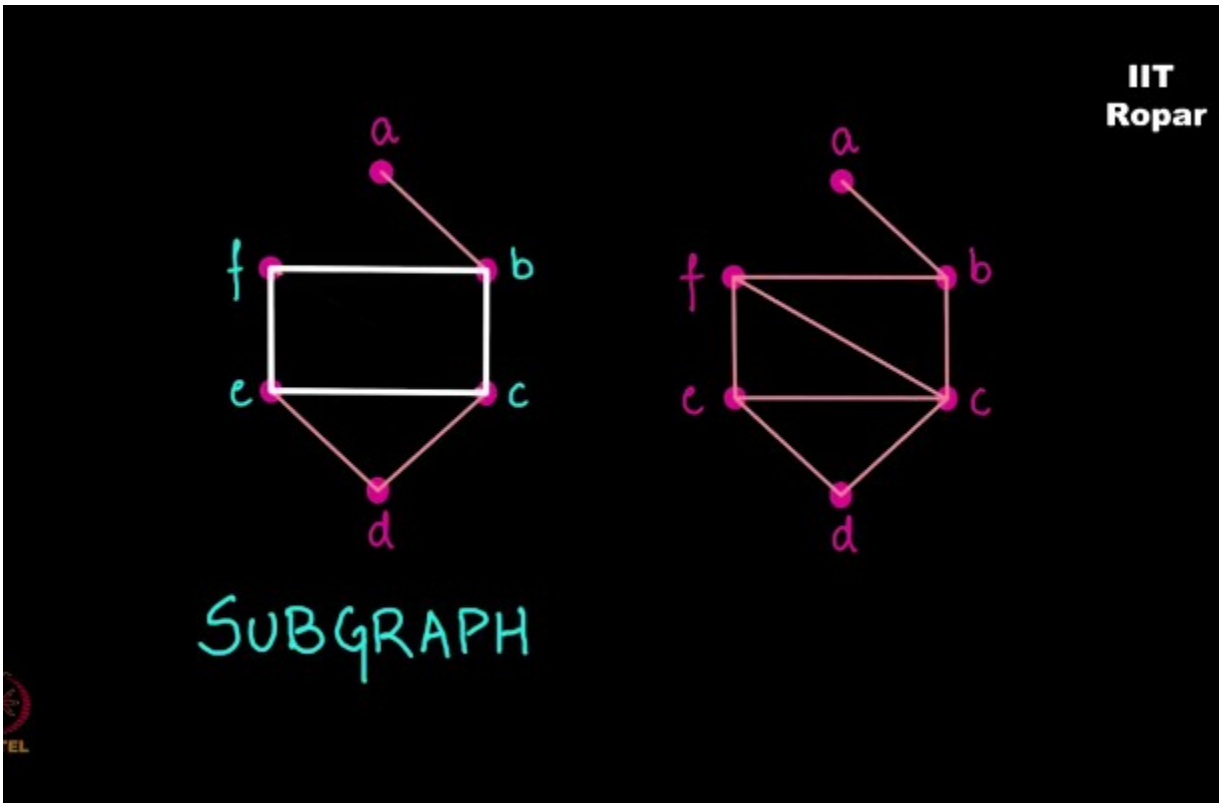

you cannot have the edge B, E, that is because B, E was not an edge in the original graph, so the definition of the subgraph is given a graph G you take a subset of the vertex set V dash of the original vertex set V, and take a subset of the edge set E dash of the original edge set E,

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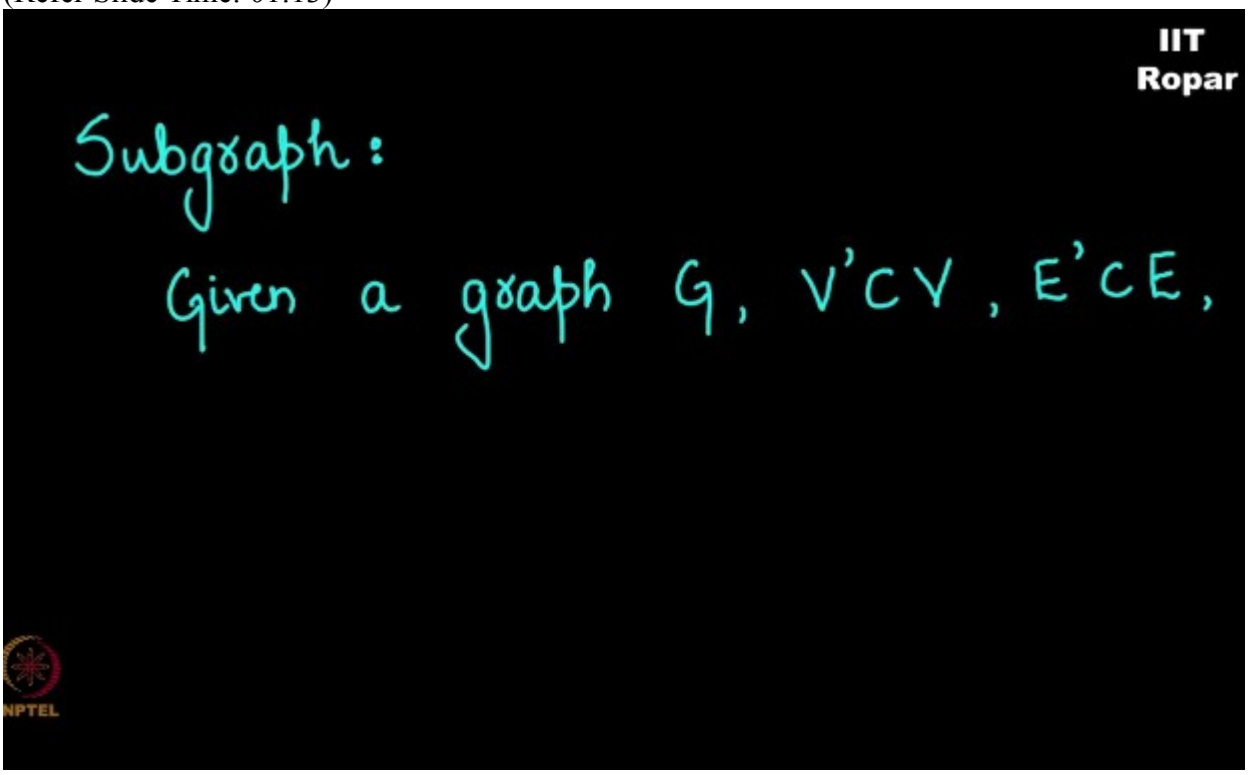

whatever you get is another graph where edges here are pick from the edges the original graph, but you cannot pick more edges than that, such a structure is called a subgraph,
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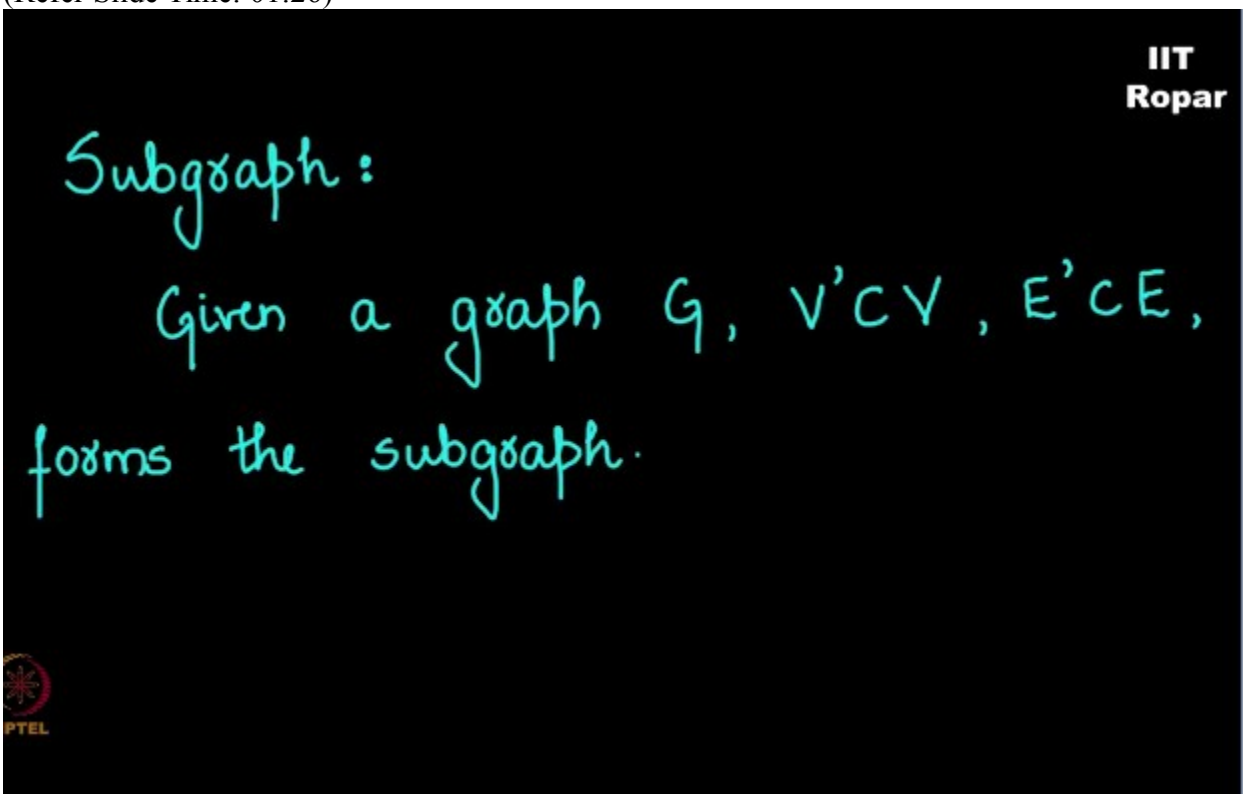

and we are going to study this in detail from now onwards.