

## Course Title: Grid and Cluster Computing Environments

**Course Type:** Main  
**Units:** 3  
**Project:** None

**Unit Type:** Theoretical  
**Teaching Hours:** 48  
**Prerequisites:** Distributed Systems, Advanced Compilers

### Objectives:

This course examines grid and cluster computing; including software architecture and resource management at grid level which are of paramount importance in distributed computing and software development.

### Course Syllabus:

1. An introduction to grid and cluster computing
2. Preparation and adaption of algorithms for grids
3. Software tools and middleware for grids
4. Resource management in grid networks
5. Security in grids
6. Indigenization of grid computing
7. Data Management in grid networks
8. Examples of toolkits and software platforms in grids

### References:

1. I. Foster and C. Kesselman, *The Grid 2: Blueprint for a New Computing Infrastructure*, 2nd ed., Morgan Kaufmann, ISBN-13: 978-1558609334 (2004)
2. F. Berman, G. Fox and T. Hey, *Grid Computing: Making the Global Infrastructure a Reality*, John Wiley & Sons, ISBN: 0-470-85319-0 (2003)
3. J. Nabrzyski, J.M. Schopf and J. Weglarz, *Grid Resouce Management: State of the Art and Future Trends*, Kluwer Academic Publishers, ISBN: 1-402-07575-8 (2003)
4. R. Buyya, *High Performance Cluster Computing*, 1st ed., Prentice Hall, ISBN: 0-130-13784-7 (1999)
5. G. Reese, *Cloud Application Architectures: Building Applications and Infrastructure in the Cloud (Theory in Practice)*, 1st ed., O'Reilly Media, ISBN: 0-596-15636-7 (2009)
6. D. Janakiram, *Grid Computing Models*, 1<sup>st</sup> edition, Tata McGraw-Hill Education (2005)
7. C.S.R. Prabhu, *Grid and Cluster Computing*, 1<sup>st</sup> editio PHI (2008)
8. Kai Hwang, Geoffrey C. Fox, Jack Dongarra, *Distributed and Cloud Computing: From Parallel Processing to the Internet of Things*, 1<sup>st</sup> edition, Morgan Kaufmann (2011)