# 17IT3201 - GRID COMPUTING

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Category:** | Program core | **Credits:** | 4 |
| **Course Type:** | Theory | **Lecture - Tutorial - Practical:** | 3-2-0 |
| **Prerequisite:** | Need to have a basic knowledge in parallel and computing techniques. | **Sessional Evaluation:****Univ. Exam Evaluation:****Total Marks:** | 4060100 |
| **Objectives** | * Understanding basic concepts, architecture and theoretical models of Grid computers.
* Importance of compiler transformations, key issues and performance evaluation in parallel operating systems.
 |

|  |  |
| --- | --- |
| **Course Outcomes** | Upon successful completion of the course, the students will be able to: |
| CO1 | Explore the need for grid computing |
| CO2 | Create awareness of Grid monitoring systems |
| CO3 | Study different types of Security systems in grid |
| CO4 | Acquire knowledge on grid scheduling. |
| CO5 | Understand various grid portals |
| CO6 | Study the performance evaluation of grid computing with case study |
| **Course Content** | UNIT - I**Concepts and Architecture:** Introduction, Parallel and Distributed Computing, Cluster Computing, Grid Computing, Anatomy and Physiology of Grid,Web and Grid Services, Grid Standards , OGSAWSRF - Trends, Challenges and Applications.UNIT-II**Grid Monitoring:** Grid Monitoring Architecture (GMA), An Overview of Grid Monitoring Systems, GMA, GridICE, DS, Service Level Agreements (SLAs), Other Monitoring Systems - Ganglia, GridMon, Hawkeye and Network Weather Service.UNIT-III**Grid Security:** A Brief Security Primer, Cryptography, Symmetric cryptosystemes, Asymmetric cryptosystems, Digital signatures, PKI-X509 Certificates, certification Authority, Firewalls, Grid Security.UNIT-IV**Grid Scheduling and Resource Management:** Gridway and Gridbus Broker, Principles of Local Schedulers, Overview of Condor, SGE, PBS, LSF, Grid Scheduling with QoS.UNIT-V**Data Management and Grid Portals:** Data Management, Categories and Origins of Structured Data, Data Management Challenges, Architectural Approaches, Collective Data Management Services, Federation Services, Grid Portals, Generations of Grid Portals.UNIT-VI**Grid Middleware:** List of globally available Middlewares, Case Studies - Recent version of Globus Toolkit and gLite - Architecture, Components and Features, Features of next generation grid. |
| **Text Books and References:** | Text Books:1. The Grid 2: Blueprint for a New Computing Infrastructure by Ian Foster, Carl Kesselman, Elsevier Series, 2004.
2. The Grid: Core Technologies by Maozhen Li , Mark Baker , Wiley, 2005
 |
| Reference Books:1. Grid Computing for Developers by Vladimir Silva, Charles River Media, January 2006.
2. Global Grids and Software Toolkits: A Study of Four Grid Middleware Technologies, High Performance Computing: Paradigm and Infrastructure by Parvin Asadzadeh, Rajkumar Buyya, Chun Ling Kei, Deepa Nayar, and Srikumar Venugopal, Laurence Yang and Minyi Guo (editors), Wiley Press, New Jersey, USA, June 2005.
3. Grid Resource Management: State of the Art and Future Trends , (International Series in Operations Research & Management Science) by Jarek Nabrzyski, Jennifer M. Schopf, Jan Weglarz, Springer; First edition, 2003
4. Grid Computing by Joshy Joseph, Craig Fellenstein, IBM Press, 2004
 |
| **E-Resources** | 1. <https://nptel.ac.in/courses>
2. <https://freevideolectures.com/university/iitm>
 |