



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

Accredited "A" Grade by NAAC | 12B Status by UGC | Approved by AICTE

www.sathyabama.ac.in

SCHOOL OF ELECTRICAL AND ELECTRONICS

Minutes of Board of Studies Meeting held on 7th May 2022

(Virtual Meeting conducted on Zoom Platform (Time: 10.30 a.m. to 12 noon))

- Dr.N.M.Nandhitha, Prof. & Dean School of Electrical and Electronics started the meeting by welcoming both the external and the internal numbers to the Board of Studies meeting (07.05.2022, 10.00 a.m. to 12.00 noon)
- Dr.T.Ravi, Head, Dept. of Electronics and Communication Engineering informed the board that core competencies are identified from the feedback obtained from the students, faculty, Alumni and employers.
- Dr.P.Kavipriya presented the revision carried out in the course Machine Learning Techniques. Dr.M.D.Selvaraj Associate Professor, IIITDM accepted the changes and suggested to include topics such as Occam learning, accuracy and confidence boosting.
- Dr.E.Annadevi suggested to introduce 'IoT in Logistics Sector' in the course IoT for Real Time Application. Dr.N.Sivakumaran Prof.,NIT, Tiruchy accepted the inclusion and also suggested to include Healthcare monitoring Technique for Diabetes Patients.
- Dr.P.Chitra suggested to include the topics 'Machine learning, Artificial neural networks and deep Architectures' in the course Digital Image Processing for Real Time Applications. Dr.Sugudev presented the syllabus revision carried in the course Wireless Communication. Dr.N.Shivakumaran accepted the changes for both the courses.
- Having discussed the revisions in the existing courses, faculty then presented the syllabus for the new courses. Dr.T.Ravi presented the syllabus 'Graphical Programming for Engineers', 'Augmented Reality and Virtual Reality', 'Advanced Electronic Test Engineering' and 'Industry 5.0 for Electronics Engineers' for UG courses. The new syllabus introduced for PG 'Artificial Intelligence for Industrial Applications' and 'Strategies in Industry 5.0' is also briefed by HOD. Dr.M.D.Selvaraj accepted the syllabus for all the courses.

BoS members are happy that the new and the revised courses enhance employability/ Entrepreneurship/Skills of the students.

EXTERNAL MEMBERS:

1. Dr.N.Sivakumaran
2. Dr.M.D.Selvaraj
3. Mr.J.Visweswaran

INTERNAL MEMBERS:

1. Dr.N.M.Nandhitha *MC*
2. Dr.T.Ravi *Oh*
3. Dr.P.Chitra *P.Chitra*
4. Dr.S.Barani *Barani*
5. Dr.S.Poornapushpakala. *S.Poornapushpakala*
6. Dr.M.Sumathi *Sumathi*
7. Dr.S.Lakshmi *Lakshmi*
8. Dr.P.Kavipriya *P.Kavipriya*
9. Mr M Sugadev *M Sugadev*
10. Ms.E.Anna Devi *E. Anna Devi*
11. Ms.S.Yogalakshmi *Yogalakshmi*



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SCHOOL OF ELECTRICAL AND ELECTRONICS

Minutes of Board of Studies Meeting held on 26th NOVEMBER 2021

(Virtual Meeting conducted on Zoom Platform (Time: 10.30 a.m. to 12 noon))

- Dr.N.M.Nandhitha, Prof. & Dean School of Electrical and Electronics started the meeting by welcoming both the external and the internal numbers to the Board of Studies meeting (26.11.2021, 10.00 a.m. to 12.00 noon)
- Dr.T.Ravi, Head, Dept. of Electronics and Communication Engineering informed the board that core competencies are identified from the feedback obtained from the students, faculty, Alumni and employers.
- Dr.I.Rexlin sheeba proposed to include Signalling System R2, SS7 Layers and its Protocol topic in Telecommunication and switching System. Dr.M.D.Selvaraj Associate Professor, IITDM accepted the changes and suggested to include topics such as Techniques to improve the Quality of service, Format, Protocol in multicast and IETF Data Tracker.
- Dr.V.VijayaKumar suggested to introduce 'sensor and actuators for IoT Application' in the course Measurement and Instrument. Dr.N.Sivakumaran Prof.,NIT, Tiruchy accepted the inclusion and also suggested to introduce infrared sensors.
- Dr.M.Sumathi suggested to include the topics 'Realizing application in FPGA' in the course Programming in HDL. Dr.N.Shivakumaran accepted the changes.
- Having discussed the revisions in the existing courses, faculty then presented the syllabus for the new courses. Dr.P.Chitra presented the syllabus Deep Learning for Computer Vision and Real-time System Design. Dr.M.D.Selvaraj accepted the syllabus for both the courses.
- Dr.M.Sugadev presented the syllabus for Digital System Design and Verification using System Verilog. Dr.N.Sivakumaran suggested to include Real Time implementation topic in the syllabus.

BoS members are happy that the new and the revised courses enhance employability/ Entrepreneurship/Skills of the students.

EXTERNAL MEMBERS:

1. Dr.N.Sivakumaran
2. Dr.M.D.Selvaraj
3. Mr.J.Visweswaran

INTERNAL MEMBERS:

1. Dr.N.M.Nandhitha *MC*
2. Dr.T.Ravi *Oh*
3. Dr.P.Chitra *Pulita*
4. Dr.S.Barani *Barani*
5. Dr.S.Poornapushpakala. *Skaran*
6. Dr.M.Sumathi *Sam*
7. Dr.S.Lakshmi *lenu*
8. Dr.P.Kavipriya *B*
9. Mr M Sugadev *msug*
10. Ms.E.Anna Devi *E. Anna*
11. Ms.S.Yogalakshmi *yoga*

**SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING**

M.E (Embedded and IoT)

2021-22 SYLLABUS REVISION

SL.N O	COURSE CODE	COURSE NAME
1.	SECA7020	High Performance Computing

SECA7020	HIGH PERFORMANCE COMPUTING	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To understand the basics of organizational and architectural issues related to high performance computing.
- Demonstrate the basic structure and operation of a high performance computing.
- To explore the fundamental concepts of HPC Administration, Application porting, execution and scalability analysis.

UNIT 1 BASICS OF HIGH PERFORMANCE COMPUTING

9Hrs.

Basics of Organizational and Architectural issues related to High Performance Computing, Demonstrate the Basic Structure and Operation of a HPC, Explore the Fundamental Concepts of HPC Administration.

UNIT 2 APPLICATION PORTING

9 Hrs.

Application Porting, Execution and Scalability Analysis: Compiler Flags, Vectorization, Memory Alignment of Data, Porting of Application on Linux, Measurement of Application Execution time and Memory consumption with small, medium and large datasets.

UNIT 3 SCALABILITY ANALYSIS AND SECURITY

9Hrs.

Scalability Analysis and Identification of Performance Bottlenecks, Profiling of Applications to find opportunities for Performance Optimization. Security Fundamentals, Firewalls, Types of Firewalls, Limitations of firewall.

UNIT 4 INTRUSION DETECTION

9Hrs.

Intrusion Detection and Prevention, Intrusion Risks, Security Policy, Monitoring and Reporting of Traffics, Traffic Shaping, Investigating and Verifying Detected Intrusions, **Reporting and Documenting Intrusions.**

UNIT 5 INTRUSION PREVENTION

9Hrs.

Define the Types of Intrusion Prevention Systems, Intrusion Prevention System Basics, and Limitations of Intrusion Prevention System, Spoof Prevention, Denial of Service (DoS), and Quality of Service (QoS) Policy, Web Application Firewall, Packet Signature and Analysis.

Max. 45Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to:

CO1 - Articulate HPC Clustering, Parallel file system, Data Center Design and HPC Solutions & their applications.

CO2 - Understand the cloud privacy and security concepts to create secure cloud environment.

CO3 - Attain in-depth knowledge and understanding of the HPC System Administration domain.

CO4 - Manage the HPC infrastructure like (Network, Storage, Resource and Backup Management)

CO5 - Design and develop an efficient data center.

CO6 - Undertake industrial research projects for the development of future solutions in the domain of HPC Administration

TEXT / REFERENCE BOOKS

1. Dave Knifton, "Enterprise Data Architecture: How to navigate its landscape", Paragon, 3rd Edition, 2014.
2. W.H. Inmon Daniel Linstedt, "Data Architecture: A Primer for the Data Scientist: Big Data, Data Warehouse and Data Vault", MorganKauffman, 1st Edition, 2014.
3. Martin Oberhofer, EberhardHechler, Mario Godinez, Klaus Koenig, Michael Schroeck, Steve Lockwood, "The Art of Enterprise Information Architecture: A Systems-Based Approach for Unlocking Business Insight", IBM Press, 1st Edition, 2010.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration: 3 Hrs.

PART A: 5 Questions of 6 Marks each – No choice

30 Marks

PART B: 2 Questions from each unit of internal choice, each carrying 14 Marks

70 Marks

SECA7020	HIGH PERFORMANCE COMPUTING	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To understand the basics of organizational and architectural issues related to high performance computing.
- Demonstrate the basic structure and operation of a high performance computing.
- To explore the fundamental concepts of HPC Administration, Application porting, execution and scalability analysis.
- To explore system architecture for high performance computing

UNIT 1 BASICS OF HIGH PERFORMANCE COMPUTING

9Hrs.

Basics of Organizational and Architectural issues related to High Performance Computing, Demonstrate the Basic Structure and Operation of a HPC, Explore the Fundamental Concepts of HPC Administration.

UNIT 2 APPLICATION PORTING

9 Hrs.

Application Porting, Execution and Scalability Analysis: Compiler Flags, Vectorization, Memory Alignment of Data, Porting of Application on Linux, Measurement of Application Execution time and Memory consumption with small, medium and large datasets.

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Scalability Analysis and Identification of Performance Bottlenecks, Profiling of Applications to find opportunities for Performance Optimization. Security Fundamentals, Firewalls, Types of Firewalls, Limitations of firewall.

UNIT 4 INTRUSION DETECTION AND PREVENTION

9Hrs.

Intrusion Risks, Security Policy, Monitoring and Reporting of Traffics, Traffic Shaping, Investigating and Verifying Detected Intrusions- Intrusion Prevention System Basics-Spoof Prevention, Denial of Service (DoS), and Web Application Firewall, Packet Signature and Analysis.

UNIT 5 HIGH PERFORMANCE COMPUTING (HPC) SYSTEMS

9Hrs.

Multicore processor architectures - Parallel programming patterns - Models of parallel processing- Shared memory programming - Distributed memory programming - Performance metrics of HPC.

Max. 45Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to:

CO1 - Articulate HPC Clustering, Parallel file system, Data Center Design and HPC Solutions & their applications.

CO2 - Analyze system architectures for high performance computing.

CO3 - Attain in-depth knowledge and understanding of the HPC System Administration domain.

CO4 - Manage the HPC infrastructure like (Network, Storage, Resource and Backup Management)

CO5 - Design and develop an efficient data center.

CO6 - Undertake industrial research projects for the development of future solutions in the domain of HPC Administration

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PART B: 2 Questions from each unit of internal choice, each carrying 14 Marks

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