## Department of Computer Science and Engineering

## Minutes of 5th Board of Studies Meeting (UG)

The Fifth Board of Studies meeting of Computer Science and Engineering Department was held on **17th September 2022 at 10:00 A.M** at Centre V lab, EEE block, Sri Manakula Vinayagar Engineering College, with Head of the Department in the Chair through online mode.

The following members were present for the BoS meeting

| Sl.No | Name of the Member with Designation and official Address | Responsibility in the BoS |
|---|---|---|
| 1 | Dr. K.Premkumar,M.E,Ph.D.,<br>Professor and Head,<br>Department of Computer Science and Engineering,<br>Sri Manakula Vinayagar Engineering College | Chairman |
| 2 | Dr. S. R. Balasundaram,<br>Professor and Head<br>Department of Computer Applications,<br>National Institute of Technology, Trichy. | Subject Expert<br>(Pondicherry University Nominee) |
| 3 | Dr. Chokkalingam Subramanian, Professor & Head,<br>Department of Information Technology,<br>Saveetha University,<br>Chennai. | Subject Expert<br>(Academic Council Nominee) |
| 4 | Dr.S.Udhayakumar,<br>Professor,<br>School of Engineering ,<br>Amrita Vishwa Vidyapeetham,<br>Chennai | Subject Expert<br>(Academic Council Nominee) |
| 5 | S.Diwahar, M.Tech.,<br>Senior Engineer,<br>Dell Technologies, Bangalore | Representative<br>from Industry |
| 6 | R.Sakthi Murugan,<br>Director, Interjet India Pvt. Ltd.,<br>Puducherry. | Postgraduate Alumnus<br>(nominated by the Principal) |
| 7 | Dr. M.Ganesan,<br>Professor, Department of CSE, SMVEC. | Internal Member |
| 8 | Dr.R.Ramachandiran,<br>Associate Professor, Department of CSE, SMVEC. | Internal Member |
| 9 | Dr.T.Megala,<br>Assistant Professor, Department of CSE, SMVEC | Internal Member |
| 10 | Dr.M.A.Ishrath Jahan<br>Associate Professor, Department of English, SMVEC | Internal Member |
| 11 | Dr.T.Jayavarthanan<br>Professor, Department of Physics, SMVEC | Internal Member |
| 12 | Dr.S.Savithiri,<br>Professor, Department of Chemistry, SMVEC | Internal Member |
| 13 | Prof.K.Raja,<br>Asst. Prof., Department of Mathematics, SMVEC | Internal Member |



2.A.3.1

| Agenda of the Meeting | |
|---|---|
| Item No. : BoS/ UG/ CSE 5.1 | Confirmation of minutes of 4th BoS meeting held on 12.02.2022 and The Curriculum Structure of B.Tech Computer Science and Engineering of R-2019 up to VIII semester and R-2020 up to VIII semester Regulations – for any Modifications. |
| Item No. : BoS/ UG / CSE 5.2 | To discuss about any updation needed in B.Tech. Degree curriculum and the syllabus approval for VIII semester under Autonomous Regulation R-2020 from the students admitted in the AY 2020-21 onwards. |
| Item No. : BoS/ UG / CSE 5.3 | Consideration of offering of Professional and Open electives in VII semester students admitted in the Academic Year 2019-20. The students should have to register one professional and one open elective as per Regulation R-2019. |

a) The students are registered the following *professional electives* in VII semester

| Offering Department | Course Code / Course Name | Number of Students registered |
|---|---|---|
| CSE | Network Security(U19CSE17) | 60 |
| CSE | Virtual Reality (U19CSE73) | 116 |
| | **Total Number of Students** | **176** |

b) The students are registered the following *Open electives* in VII semester which is offered by other departments

| Offering Department | Course Name | Number of Students registered |
|---|---|---|
| ECE | U19ECO76: Sensors for Industrial Applications | 120 |
| IT | U19IT076: Automation Techniques & Tools DevOps | 56 |
| | **Total Number of Students** | **176** |

Consideration of offering of Professional and open electives in IV semester for students admitted in the Academic year 2020-21.They should have to register one professional and one open elective as per Regulation R-2020

a) The students are registered the following professional electives in IV semester

| Offering Department | Course Name | Number of Students registered |
|---|---|---|
| CSE | U20CSE402: E-Business | 126 |
| CSE | U20CSE403: Object Oriented Analysis and Design | 62 |
| | **Total Number of Students** | **188** |



2.A.3.2

b) The students are registered the following Open electives in IV semester which is offered by other Departments

| Offering Department | Course Name | Number of Students registered |
|---|---|---|
| ECE | U20ECO402:Consumer Electronics | 126 |
| EEE | U20EEO402: Electrical Safety | 62 |
| | **Total Number of Students** | **188** |

| | |
|---|---|
| Item No. : BoS/ UG / CSE 5.4 | To discuss and recommend the panel of examiners to the Academic Council |
| Item No. : BoS/ UG / CSE 5.5 | Any other item with the permission of chair. |

**Minutes of the Meeting**

Dr. K.Premkumar, Chairman, BoS opened the meeting by welcoming and introducing the external members, to the internal members and the meeting thereafter deliberated on agenda items that had been approved by the Chairman.

**Item No. : BoS/ UG/ CSE 5.1**

Confirmation of minutes of 4th BoS meeting held on 12.02.2022 and the Syllabi of B.Tech Computer Science and Engineering of R-2019 and R-2020 Regulations – for any Modifications.

Chairman, BoS, apprised the minutes of 4th BoS, its implementation and then it is confirmed with the approval in 4th BoS meeting for the incorporation of minor revisions needed as mentioned below.

| S. No | Regulation | Semester | Course Name with Code | Unit | Suggestions given and Changes incorporated |
|---|---|---|---|---|---|
| 1 | R-19 | VIII | U19CSE86 TRUST COMPUTING | - | Experts suggested to Rename the course name from "Trust Computing" to "Trusted Computing. The above stated correction is incorporated and enclosed in Annexure-1 |
| 2 | R-19 | VIII | U19CSE87 Client Server Computing | | Recommended to include new types of servers in Unit III. Unit III to be titled as "Servers". The above stated suggestion is incorporated and enclosed in Annexure-1 |



2.A.3.3

| | | | | | |
|---|---|---|---|---|---|
| 3 | R-19 | VIII | U20CSE88 Human Computer Interaction | | Experts Recommended to add latest version of Text books.<br>The above stated suggestion is incorporated and enclosed in Annexure-1 |

**The above correction was incorporated and approved by BoS members in 4th BoS meeting, and the details are enclosed in Annexure - I.**

**Item No. : BoS/ UG/ CSE 5.2**

To discuss about any updation needed in B.Tech. Degree curriculum and the syllabus approval for VIII semester under Autonomous Regulations R-2020 from the students admitted in the AY 2020-21 onwards.

The B.Tech. Degree curriculum and syllabus approval of VIII semesters under Autonomous Regulations 2020 for the B.Tech programme and the students admitted in the AY 2020-21 were discussed and recommended with the following modifications.

| S. No | Regulation | Semester | Subject Name with code | Unit | Particulars |
|---|---|---|---|---|---|
| 1 | R-20 | VIII | Block chain and Cryptography-U20CST819 | I | Experts Recommended to remove the topic "Hash function and digital signature" from unit I since the syllabus as separate unit on cryptographic Techniques. |
| | | | | IV | The expert panel has suggested to rename unit IV title as "Cryptography Techniques" instead of "Introduction to Cryptography" |
| 3 | R-20 | VIII | Practical-Entrepreneurship Management-U20HSP804 | - | Experts have suggested to include latest version of the text book. |
| 4 | R-20 | VIII | Professional Elective V - Pervasive Computing-U20CSE824 | II | Recommended to include the topic "Wireless Markup Language(WML)" since introducing WML with XML would be appropriate. |
| 5 | R-20 | VIII | Professional Elective VI – Quantum Computing-U20CSE826 | - | The Expert Panel as recommended to reduce the Syllabus since it is a very new domain under research. |



2.A.3.4

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|---|---|---|---|---|---|
| 6 | R-20 | VIII | Professional Elective VI – U20CSE827 - Trusted computing | III,V | The Expert panel has suggested to remove the title "Trusted Platform Module tools" from unit V and to include the same in unit III as unit III introduces different tools. |
| 7 | R-20 | VIII | Professional Elective VI – U20CSE828 - Client Server Computing | II | Experts have recommended to include topics on "Middleware" in Unit II |
| | | | | III | Recommended to include new types of servers in Unit III. |

**The above correction was incorporated and approved by BoS members in 5th BoS meeting, and the details are enclosed in Annexure - II.**

**Item No. : BoS/ UG/ CSE 5.3**

Consideration of offering and approval of Professional and Open electives in VII semester students admitted in the Academic Year 2019-20. The students should have to register one professional and one open elective as per Regulation R-2019.

a) The students are registered the following *professional electives* in VII semester

| Offering Department | Course Code / Course Name | Number of Students registered |
|---|---|---|
| CSE | Network Security(U19CSE17) | 60 |
| CSE | Virtual Reality (U19CSE73) | 116 |
| | **Total Number of Students** | **176** |

b) The students are registered the following *Open electives* in VII semester which is offered by other departments

| Offering Department | Course Name | Number of Students registered |
|---|---|---|
| ECE | U19ECO76: Sensors for Industrial Applications | 120 |
| IT | U19IT076: Automation Techniques & Tools DevOps | 56 |
| | **Total Number of Students** | **176** |

Consideration of offering and approval of Professional and open electives in IV semester for students admitted from the Academic year 2020-21 onwards. They should have to register one professional and one open elective as per Regulation R- 2020



2.A.3.5

a) The students are registered the following professional electives in IV semester

| Offering Department | Course Name | Number of Students registered |
|---|---|---|
| CSE | U20CSE402: E-Business | 126 |
| CSE | U20CSE403: Object Oriented Analysis and Design | 62 |
| **Total Number of Students** | | **188** |

b) The students are registered the following Open electives in IV semester which is offered by other Departments

| Offering Department | Course Name | Number of Students registered |
|---|---|---|
| ECE | U20ECO402:Consumer Electronics | 126 |
| EEE | U20EEO402: Electrical Safety | 62 |
| **Total Number of Students** | | **188** |

Discussed about the offering of Professional and Open electives in VII semester and IV semester students admitted from the Academic Year 2019-20 onwards. The students have registered for one professional and one open elective as per Regulation R-2019. It was approved by BoS members

**Item No. : BoS/ UG/ CSE 5.4**

To discuss and recommend the panel of examiners to the Academic Council

The list of question paper setters and Evaluators **(given in Annexure-III)** was presented and recommended by the BoS members to the academic council.

**Item No. : BoS/ UG/ CSE 5.5**

Any other item with the permission of chair.

The panel discussed about bringing up new research topic in curriculum



2.A.3.b

## Department of Computer Science and Engineering

## Minutes of 5th Board of Studies Meeting (Ph.D)

| Agenda of the Meeting | |
|---|---|
| Item No. : BoS/ Ph.D/ CSE 5.1 | Confirmation of minutes of 4th BoS meeting held on 12.02.2022 and Regulations of Ph.D in Computer Science and Engineering of R-2020 – for any Modifications. |
| Item No. : BoS/ Ph.D / CSE 5.2 | To discuss and get approval for the students admitted in Ph.D in Computer Science and Engineering from the Academic Year 2021-2022 |
| Item No. : BoS/ Ph.D/ CSE 5.3 | To discuss and recommend the doctoral Committee members of the admitted students to the academic council |
| Item No. : BoS/ Ph.D / CSE 5.4 | Any other item with the permission of chair. |

### Minutes of the Meeting

Dr. K.Premkumar, Chairman, BoS opened the meeting by welcoming and introducing the external members, to the internal members and the meeting thereafter deliberated on agenda items that had been approved by the Chairman.

### Item No. : BoS/ Ph.D/ CSE 5.1

Confirmation of minutes of 4th BoS meeting held on 12.02.2022 and Regulations of Ph.D in Computer Science and Engineering of R-2020 – for any Modifications

Chairman, BoS, apprised the minutes of 4th BoS, its implementation and then it is confirmed with the approval in 4th BoS meeting and recommended without any modifications

### Item No. : BoS/ Ph.D/ CSE 5.2

To discuss and get approval for the students admitted in Ph.D in Computer Science and Engineering from the Academic Year 2021-2022

The students admitted in Ph.D in Computer Science and Engineering from the academic year 2021-2022 were discussed and List of students enrolled is enclosed in Annexure- IV

### Item No. : BoS/ Ph.D/ CSE 5.3

To discuss and recommend the doctoral Committee members of the admitted students to the academic council

The doctoral Committee members for students admitted in Ph.D in Computer Science and



2.A.3.7

Engineering were introduced and the doctoral committee members list is enclosed in Annexure - V

**Item No. : BoS/ Ph.D/ CSE 5.4**

Any other item with the permission of chair

The committee were happy about number of internal students registered for Ph.D

The meeting for the above Agenda regarding B.Tech – Computer Science and Engineering was concluded by 1:00 pm with by **Dr. K.Premkumar**, Chairman-BoS and Head of Department, Department of Computer Science and Engineering, Sri Manakula Vinayagar Engineering College.

| Sl.No | Name of the Member with Designation and official Address | Responsibility in the BoS | Signature |
|---|---|---|---|
| 1 | Dr. K.Premkumar,M.E,Ph.D.,<br>Professor and Head,<br>Department of Computer Science and Engineering,<br>Sri Manakula Vinayagar Engineering College | Chairman | |
| **External Members** | | | |
| 2 | Dr. S. R. Balasundaram,<br>Professor and Head<br>Department of Computer Applications,<br>National Institute of Technology, Trichy. | Subject Expert (Pondicherry University Nominee) | |
| 3 | Dr. Chokkalingam Subramanian,<br>Professor & Head,<br>Department of Information Technology,<br>Saveetha University, Chennai. | Subject Expert (Academic Council Nominee) | |
| 4 | Dr.S.Udhayakumar,<br>Professor,<br>School of Engineering ,<br>Amrita Vishwa Vidyapeetham,<br>Chennai | Subject Expert (Academic Council Nominee) | |
| 5 | S.Diwahar, M.Tech.,<br>Senior Engineer,<br>Dell Technologies, Bangalore | Representative from Industry | |
| 6 | R.Sakthi Murugan,<br>Director,<br>Interjet India Pvt. Ltd.,<br>Puducherry. | Postgraduate Alumnus (nominated by the Principal) | |
| **Internal Members** | | | |
| 7 | Dr. M.Ganesan,<br>Professor, Department of CSE,<br>SMVEC. | Internal Member | |
| 8 | Dr.R.Ramachandiran,<br>Associate Professor, Department of CSE, SMVEC. | Internal Member | |
| 9 | Dr.T.Megala,<br>Assistant Professor, Department of CSE, SMVEC | Internal Member | |



2.A.3.8

| Co-opted Members | | | |
|---|---|---|---|
| 10 | Dr.M.A.Ishrath Jahan<br>Associate Professor,<br>Department of English, SMVEC | Internal Member | |
| 11 | Dr.T.Jayavarthanan<br>Professor,<br>Department of Physics, SMVEC | Internal Member | |
| 12 | Dr.S.Savithiri,<br>Professor, Department of Chemistry, SMVEC | Internal Member | |
| 13 | Prof.K.Raja,<br>Assistant Professor, Department of Mathematics, SMVEC | Internal Member | |



2.A.3.9

| | | | |
|---|---|---|---|
| 10 | Dr.M.A.Shahul Hadjo<br>Associate Professor,<br>Department of English, SRMVEC | Internal Examiner | |
| 11 | Dr.T.Jayavelu<br>Professor,<br>Department of Physics, SRMVEC | Internal Member | |
| 12 | Dr.S.Sankar,<br>Professor, Department of Chemistry,<br>SRMVEC | Internal Member | |
| 13 | Prof.K.Raja,<br>Assistant Professor, Department of<br>Mathematics, SRMVEC | Internal Member | |

2.A.3.10

# ANNEXURE I

2.A.3.11

2.A.3.12

## ANNEXURE -1

| | | L | T | P | C | Hrs |
|---|---|---|---|---|---|---|
| U19CSE86 | TRUSTED COMPUTING | 3 | 0 | 0 | 3 | 45 |

**Course Objectives**

- To design the goals in the trusted platforms.
- To understand the comprehensive overview of the trust architecture and its applications.
- To experiment with TCG and to implement different tools.
- To demonstrate different encryption algorithms for security purposes.
- To learn about the trusted devices and their maintenance.

**Course Outcomes**

*After completion of the course, the students will be able to*

**CO1** – Summarize the concept of trust categories.
**CO2** – Demonstrate trust architecture and formalization of security architecture.
**CO3** – Analyse about the TPM and TCG.
**CO4** – Understand about the cryptographic standards.
**CO5** – Summarize trusted computing and its administration.

**UNIT I INTRODUCTION TO TRUST COMPUTING** **(9Hrs)**

Introduction – Trust and Computing – Instantiations – Design and Applications – Progression – Motivating scenarios – Attacks. Design goals of the trusted platform modules. Introduction to simulators – Implementation of attacks.

**UNIT II TRUST ARCHITECTURE** **(9Hrs)**

Foundations – Design challenges – Platform Architecture – Security architecture – erasing secrets – sources – software threats – code integrity and code loading. Outbound Authentication – Problem – Theory – Design and Implementation - Validation – Process – strategy – Formalizing security properties – Formal verification – other validation tasks – reflection.

**UNIT III TCG TCPA** **(9Hrs)**

Programming Interfaces To TCG. Experimenting with TCPA/TCG – Desired properties- Lifetime mismatch – Architecture – Implementation – Applications. Writing a TPM device driver- Low level software – Trusted boot – TCG software stack – Using TPM keys. Implementation using simulator tools.

**UNIT IV CRYPTOGRAPHIC STANDARDS** **(9Hrs)**

TSS core service – Public key cryptography standard – Architecture – Trusted computing and secure storage – Linking to encryption algorithms – encrypting files and locking data to specific PCs-content protection – secure printing and faxing. Simulation analysis of symmetric and public key cryptographic standards - performance evaluation of these trust models.

**UNIT V ADMINISTRATION OF TRUSTED DEVICES** **(9Hrs)**

Trusted Computing And Secure Identification Administration of trusted devices – Secure /backup maintenance – assignment of key certificates-secure time reporting-key recovery – TPM tools-Ancillary hardware.

2.A.3.13

2. A · 3 · 14

## Text Books


1. Xujan Zhou, YueXu, Yuefeng Li, Audun Josang, and Clive Cox, "The state of-the-art in personalized recommender systems for social networking. Artificial Intelligence Review", Issue C, pp.1-14, Springer, 2011.
2. Challener D., Yoder K., Catherman R., Safford D., Van Doorn L. "A Practical Guide to Trusted Computing", IBM press, 2008.
3. Sean W. Smith, "Trusted Computing Platforms: Design and Applications", Springer Science and Business media, 2005.


## Reference Books


1. Dengguo Feng, "Trusted Computing" Tsinghua University Tsinghua University Press Released December Publisher(s): De Gruyter, 2017.
2. A Practical Guide to Trusted Computing (IBM Press), December 2007.
3. Trusted Computing Platforms Design and Applications, 2005.
4. Trusted Computing Platforms: TCPA Technology in Context by Pearson Education , July 2002.
5. John Linn, "Trust Models and management in Public Key Infrastructures", November 2000.


## Web Resources

1. https://trustedcomputinggroup.org/
2. https://en.wikipedia.org/wiki/Trusted_Computing
3. https://www.techopedia.com/definition/16523/trusted-computing
4. https://webstore.ansi.org/industry/software/encryption-cryptography
5. https://csrc.nist.rip/Projects/Cryptographic-Standards-and-Guidelines.

**COs/POs/PSOs Mapping**

| COs | Program Outcomes (POs) | | | | | | | | | | | | Program Sp Outcomes (I | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | 2 | 3 | - | 3 | 3 |
| 2 | 3 | 3 | 3 | 3 | - | 3 | - | 3 | - | 2 | - | 2 | 2 | 2 |
| 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | - | 3 | 3 | - | 2 | 2 |
| 4 | 2 | 2 | 2 | 2 | 2 | 2 | - | 3 | - | 3 | - | 3 | 3 | 3 |
| 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | 3 | 3 | 3 | 3 | 3 |

**CorrelationLevel:1-Low,2-Medium,3-High**

2.A.3.15

2.A.3.16

| | | L | T | P | C | Hrs |
|---|---|---|---|---|---|---|
| U19CSE87 | CLIENT SERVER COMPUTING | 3 | 0 | 0 | 3 | 45 |

**Course Objectives**

- Comprehend the basic concepts of the client-server model
- Describe how the hardware and software are combined to implement client/server computing.
- To expose terminology, concepts and types of servers in client/server architecture.
- Explore the different server operating systems and its components
- Explore about the Impact of Technology & Training and Testing Technology

**Course Outcomes**

*After completion of the course, the students will be able to*

**CO1** - Understand and analyze about the history of C/S computing.

**CO2** - Analyze the different client/server models.

**CO3** - Be familiar with the types, features and components of Server in C/S systems.

**CO4** - Analyze the different server operating systems and its components.

**CO5** - Known about the impact of Technology, Training and Testing Technology.

**UNIT I INTRODUCTION TO CLIENT/SERVER COMPUTING** **(9 Hrs)**

Introduction to client/server computing-What is client/server computing-Benefits of client/server computing-Evolution of C/S computing-Hardware trends-Software trends-Evolution of operating systems-Networking (N/W) trends-Business considerations.

**UNIT II CLASSIFICATION OF CLIENT / SERVER SYSTEMS** **(9Hrs)**

**Two-tire client / Server Model:** Hardware and Software Requirements operating system services – Types of clients – Server tier.
**Three- Tier client / Server Model**: Hardware and Software Requirements – Netware connectivity – Types of Middleware – Database Middleware.
**N- Tier client / Server Model**:Overview – Benefits – Disadvantages – Components – Tier separations and interaction.

**UNIT III SERVERS** **(9Hrs)**

Server Hardware, Categories - Features classes of Server Machines - Server Environment - Network management environment - network Computing Environment - Network Operating Systems - Server requirements, Platform Independence - Transaction Processing and Connectivity - Server Data Management and Access Tools

**UNIT IV SERVER OPERATING SYSTEM** **(9Hrs)**

Server operating system: OS/2 2. 0-Windows new technology-Unix based OS-Server requirements: Platform independence-Transaction processing-Connectivity-Intelligent database-Stored procedure-Triggers-Load leveling-Optimizer-Testing and diagnostic tools – Backup&recovery mechanisms.

**UNIT V IMPACT OF TESTING TECHNOLOGY** **(9Hrs)**

Client / Server Administration and Management – Client /Server Software – Testing techniques – Testing aspects – Measures of Completeness – Testing Client / Server Application.

2.A.3.12

## Text Books


1. Munesh Chandra Trivedi,"Client/Server Computing", Khanna Book Publishing Company, Second edition,2014.
2. Chandra YadavSubhash, "Introductions to Client Server Computing", New Age International, 2009.
3. Dawana Travis Dewire, "Client/Server Computing", Tata McGraw-Hill Publishing Company Limited, New Delhi, 2003.


## Reference Books


1. Dr. S.T. Deepa, Mrs.T.Yegammai,"Client Server Computing", Charulatha Publications Private Limited, 2019.
2. Patrick Smith, Steve Guengerich," Client/Server Computing, Prentice Hall India Learning Private Limited, 2nd edition, 2011.
3. Robert Orfali, Dan Harkey and Jeri Edwards, "Essential Client/Server SurvivalGuide", Galgotia Publications, New Delhi, 2001.
4. Joel P Kaster, "Understanding Thin Client/Server Computing", Prentice Hall of India, New Delhi, 2001.
5. Karen Watterson, "Client/Server Technology for Managers ", Addition-Wesley, USA, 1996.


## Web Resources

1. http://www.studentshangout.com/topic/142825-client-server-computing-notes
2. http://www.slideshare.net/jayasreep3/client-servercomputing
3. http://www.infomotions.com/musings/waves/clientservercomputing.html
4. https://teachcomputerscience.com/client-server-architecture/
5. https://nptel.ac.in/content/storage2/courses/106105087/pdf/m17L41.pdf

**COs/POs/ PSOs Mapping**

| COs | Program Outcomes(POs) | | | | | | | | | | | | Program Specific Outcomes(PSOs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| 1 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | - | - | 2 | 2 | - | 3 | 3 | 3 |
| 2 | 2 | 3 | 2 | 3 | 3 | 1 | 1 | - | - | 2 | 2 | - | 3 | 3 | 3 |
| 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | - | - | 2 | 2 | - | 3 | 3 | 3 |
| 4 | 2 | 2 | 3 | 3 | 3 | 2 | 1 | - | - | 2 | 2 | - | 2 | 2 | 3 |
| 5 | 3 | 2 | 3 | 3 | 3 | 3 | 1 | - | - | 2 | 2 | - | 2 | 2 | 2 |

**Correlation Level: 1-Low, 2-Medium, 3-High**

2.A.3.18

| U19CSE88 | HUMAN COMPUTER INTERACTION | L | T | P | C | Hrs |
|---|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 3 | 45 |

**Course Objectives**

- To Learn the foundations of Human Computer Interaction
- To be familiar with the design technologies for individuals and persons with disabilities
- Todemonstrate the communication using multimedia and www.
- To study about mobile ecosystem.
- To learn about user interface.

**Course Outcomes**

*After completion of the course, the students will be able to*

**CO1** - Collect fundamentals of human interaction and problem solving
**CO2** - Design effective HCI for individuals.
**CO3** - Enumerate the cognitive computerized models for HCI
**CO4** - Design mobile application framework using HCI tools.
**CO5** - Develop web interface using various tools

**UNIT I INTRODUCTION** **(9 Hrs)**

The Human: I/O channels – Memory – Reasoning and problem solving; The computer: Devices – Memory – processing and networks; Interaction: Models – frameworks – Ergonomics– styles – elements – interactivity- Paradigms.

**UNIT II INTERACTIVE DESIGN AND RULE** **(9 Hrs)**

Interactive Design basics – process – scenarios – navigation – screen design – Iteration and prototyping. HCI in software process – software life cycle – usability engineering Prototyping in practice – design rationale. Design rules – principles, standards, guidelines, rules. Evaluation Techniques – Universal Design.

**UNIT III COGNITIVE COMPUTERIZED MODELS** **(9 Hrs)**

Cognitive models –Socio-Organizational issues and stake holder requirements –Communication and collaboration models-Hypertext, Multimedia and WWW.

**UNIT IV APPLICATION FRAMEWORK (9Hrs)**

Mobile Ecosystem: Platforms, Application frameworks- Types of Mobile Applications: Widgets, Applications, Games- Mobile Information Architecture, Mobile 2.0, Mobile Design: Elements of Mobile Design, Tools.

**UNIT V DESIGNING WEB INTERFACES** **(9 Hrs)**

Designing Web Interfaces – Drag & Drop, Direct Selection, Contextual Tools, Overlays, Inlays and Virtual Pages, Process Flow. Case Studies.

**Text Books**


1. Interaction Design: Beyond Human-Computer Interaction by Helen Sharp & Jenny Preece & Yvonne Rogers 2019.
2. Interaction Design - Beyond Human-Computer Interaction, 4th Edition, 2016
3. Computer-Human Interaction. Cognitive Effects of Spatial Interaction, Learning, and Ability by Theodor Wyeld & Paul Calder & Haifeng Shen (eds.) ,2015
4. Designing Interactive Systems: A Comprehensive Guide to HCI, UX and Interaction Design. by David R. Benyon 2013.


9.4.3.19

5. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, "Human Computer Interaction", 3rd Edition, Pearson Education, 2004.

## Reference Books

1. Brian Fling, "Mobile Design and Development", Fourth Edition, O'Reilly Media Inc., 2018.
2. Cabrera & James, " Modular Design Frameworks: A Projects-based Guide for UI/UX Designers", 2017.
3. Bill Scott and Theresa Neil, "Designing Web Interfaces", First Edit ion, O'Reilly 2009.
4. Jonathan Lazar , "Research Methods in Human-Computer Interaction", 2009.
5. Yvonne Rogers, "Interaction Design: Beyond Human-Computer Interaction", 2001.

## Web Resources

1. https://www.interaction-design.org/literature/topics/human-computer-interaction
2. https://www.hcii.cmu.edu/academics/mhci
3. https://www.rit.edu/study/human-computer-interaction-ms
4. https://www.udacity.com/course/human-computer-interaction--ud400
5. https://xd.adobe.com/ideas/principles/human-computer-interaction/

### COs/POs/PSOs Mapping

| COs | Program Outcomes (POs) | | | | | | | | | | | | Program Specific Outcomes (PSOs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | 2 | 3 | - | 3 | 3 | 3 |
| 2 | 3 | 3 | 3 | 3 | - | 3 | - | 3 | - | 2 | - | 2 | 2 | 2 | - |
| 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | - | 3 | 3 | - | 2 | 2 | 2 |
| 4 | 2 | 2 | 2 | 2 | 2 | 2 | - | 3 | - | 3 | - | 3 | 3 | 3 | - |
| 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | 3 | 3 | 3 | 3 | 3 | 3 |

**Correlation Level: 1 - Low, 2 - Medium, 3 - High**

2.A.B.20

# ANNEXURE II

2.A.3.21

ANNEXURE II

| U20CST819 | BLOCKCHAIN AND CRYPTOGRAPHY | L | T | P | C | Hrs |
|---|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 3 | 45 |

**Course Objectives**

- To define the fundamental ideas behind Cloud Computing.
- To classify the basic ideas and principles in cloud information system.
- To understand about Bitcoin, Crypto currency, Ethereum and create own Blockchain network application.
- To understand cryptography concepts.
- To Understand Public Key Cryptography and Key management

**Course Outcomes**

*After completion of the course, the students should be able to:*

**CO1 -** Explain design principles of Bitcoin and Ethereum. Explain Nakamoto consensus.

**CO2 -** Explain the Simplified Payment Verification protocol. List and describe differences between proof- of-work and proof-of-stake consensus.

**CO3 -** Design, build, and deploy a distributed application. Evaluate security, privacy, and efficiency of a given blockchain system.

**CO4 -** Explain cryptography concepts.

**CO5 -** Identify and investigate public key cryptography and key management concepts.

**UNIT I BASICS** **(9 Hrs)**

Distributed Database, Two General Problem, Byzantine General problem and Fault Tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete.

**UNIT II BLOCKCHAIN** **(9 Hrs)**

Introduction, Advantage over conventional distributed database, Blockchain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee, Anonymity, Reward, Chain Policy, Life of Blockchain application, Soft & Hard Fork, Private and Public blockchain.

**UNIT III CRYPTOCURRENCY AND CRYPTOCURRENCY REGULATION** **(9 Hrs)**

History, Distributed Ledger, Bitcoin protocols - Mining strategy and rewards, Ethereum - Construction, DAO, Smart Contract, GHOST, Vulnerability, Attacks, Sidechain, Namecoin. Stakeholders, Roots of Bit coin, Legal Aspects-Crypto currency Exchange, Black Market and Global Economy. Applications: Internet of Things, Medical Record Management System, Domain Name Service and future of Block chain.

**UNIT IV CRYPTOGRAPHY TECHNIQUES** **(9 Hrs)**

Introduction to Cryptography, Security Threats, Vulnerability, Active and Passive attacks-Dimensions of Cryptography, Classical Cryptographic Techniques - Block Ciphers (DES, AES) : Feistal Cipher Structure, Simplifies DES, DES, Double and Triple DES, Block Cipher design Principles, AES, Modes of Operations.

2.A.3.22

## UNIT V PUBLIC-KEY CRYPTOGRAPHY AND KEY MANAGEMENT (9 Hrs)

Public-Key Cryptography: Principles Of Public-Key Cryptography, RSA Algorithm, Key Management, Diffie- Hellman Key Exchange, Elgamal Algorithm, Elliptic Curve Cryptography, Key Management: Key Distribution Techniques, Kerberos.

### Text books


1. Douglas Robert Stinson and Maura Paterson, "Cryptography: Theory and Practice", CRC press, 2018.
2. Imran Bashir, "Mastering Blockchain: Deeper insights into decentralization, cryptography", Packet Publishing Ltd, Kindle Edition, 2017.
3. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, "Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction", Princeton University Press, Kindle Edition, 2016.


### Reference books


1. Imran Bashir, "Mastering Blockchain: A deep dive into distributed ledgers, consensus protocols, smart contracts, DApps, cryptocurrencies, Ethereum, and more", Packt Publishing Limited, 3rd Edition,2020.
2. Andreas M. Antonopoulos,"Mastering Bitcoin: Unlocking Digital Cryptocurrencies", O'Reilly Media,2nd Edition 2017.
3. Keith M.Martin ,"Everyday Cryptography: Fundamental Principles & Applications",Oxford University Press, First edition 2016.
4. Dr.Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger," Yellow paper.2014.
5. Dr. T R Padmanabhan C K Shyamala, N Harini , "Cryptography and Security", Wiley,1st Edition,2011.


### Web Resources

1. http://chimera.labs.oreilly.com/books/1234000001802/ch08.html
2. https://bitcoin.org/bitcoin.pdf
3. https://www.geeksforgeeks.org/introduction-to-crypto-terminologies
4. https://complyadvantage.com/knowledgebase/crypto-regulations/cryptocurrency-regulations-india
5. https://www.proofpoint.com/us/threat-reference/encryption

### COs/POs/PSOs Mapping

| CO'S | Program Outcomes (POs) | | | | | | | | | | | | Program Specific Outcomes (PSOs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO3 |
| 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | - | - | 3 | - | 3 | 3 | 3 |
| 2 | 2 | 2 | 2 | 2 | - | 2 | - | 2 | - | 2 | - | 2 | 2 | 2 | - |
| 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | - | 3 | - | 3 | 3 | 3 |
| 4 | 2 | 2 | 2 | 2 | - | 2 | - | 2 | - | 2 | - | 2 | 2 | 2 | - |
| 5 | 2 | 2 | 2 | 2 | - | 2 | - | 2 | - | 2 | - | 2 | 2 | 2 | - |

**Correlation Level: 1 - Low, 2 - Medium, 3 – High**

2.A.3.23

| U20HSP804 | ENTREPRENEURSHIP MANAGEMENT | L | T | P | C | Hrs |
|---|---|---|---|---|---|---|
| | | 0 | 0 | 2 | 1 | 30 |

## Course Objectives

- To develop a clear understanding on Time Management, Stress Management and Networking Skills
- To understand the significance of Finance Skills, Branding, and Sales Skills for an Entrepreneur
- To develop an ability to identify the critical challenges hindering growth of entrepreneurs
- To examine the strategies to handle the entrepreneurial challenges
- To be aware of various Government Schemes and Subsidies available for Entrepreneurs

## Course Outcomes

*After completion of the course, the students will be able to*

**CO1 -** Demonstrate the acquisition of time management, stress handling and networking skills
**CO2 -** Practice cash management, brand building and enhancing turnover.
**CO3 -** Identify the key challenges faced by entrepreneurs.
**CO4 -** Be familiar with ways to handle the key challenges.
**CO5 -** Understand various schemes and subsidies that are offered by various Government agencies for the benefit of entrepreneurs in general, and women entrepreneurs in particular.

## UNIT I ENTRPRENEURIAL SKILLS 1 (6 Hrs)

Time Management – Priority Planning – Defining Milestones (Immediate, Very Short-Term, Short Term and Medium Term) – Addressing the issue of 'procrastination' – Timely Execution of Plans.
Stress Handling – Coping with the stress – Strategies to handle rejections – Addressing slow progress issues
Networking – Key to Success – Power of Referral and Word of Mouth.

## UNIT II ENTREPRENEURIAL SKILLS 2 (6 Hrs)

Financial Skills – Cash Management – Problems of Poor Cash Management – Learning to be Frugal.
Branding – Building a 'niche' follower for your product/service – Developing and Establishing a Brand
Sales skills – KPI of Success of Entrepreneurship – Ensuring Growth in Turnover

## UNIT III ENTREPRENEURIAL CHALLENGES: IDENTIFYING (6 Hrs)

Identifying the typical problems of Entrepreneurs in your industry/service – Key Challenges: Operational Challenges – Marketing Challenges – Financial Challenges.

## UNIT IV ENTREPRENEURIAL CHALLENGES: HANDLING (6 Hrs)

Challenges Handling – Synergy Creation – Networking with Successful people in the industry – Learning from Best Practices – Understanding the Market Needs and Addressing them adequately – Financial Planning – Avoiding 'Fund Diversions' – Maintaining Financial integrity.

## UNIT V ENTREPRENEURIAL OPPORTUNITIES (6 Hrs)

Awareness of Government Schemes and Subsidies for various Entrepreneurial Categories – Special Schemes for Women Entrepreneurs – Understanding the Procedure and Documentation Process for availing the Government Schemes – Venture Capital – Crowd funding – Angel Investors.

## Text Books


1. Storey, D. J., & Greene, F. J. "Small business and entrepreneurship", Financial Times/Prentice Hall, 2010.
2. Scarborough, N. M., "Essentials of entrepreneurship and small business management", publishing as Prentice Hall, One Lake Street, Upper Saddle River, New Jersey 07458, 2011


2.A.3.24

3. Sebastian Aparico,Andrue Turro and Maria Noguera ,"Entrepreneurship and Intrapreneurship in social, Sustainable, and Economic Development", published as sustainability, Switzerland,2021

## Reference Books

1. Brian Tracy – The Psychology of Selling.
2. Dale Carnegie – How to Win Friends & Influence People.
3. Robert Kiyosaki and Sharon Lechter – Rich Dad, Poor Dad.
4. Reid Hoffman – The Startup of You: Adapt to the Future, Invest in Yourself, and Transform Your Career.
5. Michael E. Gerber – The E-Myth Revisited.
6. Chris Guillebeau – The Art of Non-Conformity.
7. Eric Ries – The Lean Startup.
8. Kevin D. Johnson – The Entrepreneur Mind.

## Web Resources

1. https://www.helpguide.org/articles/stress/stress-management.htm
2. https://bscdesigner.com/8-entrepreneurial-kpis.htm
3. https://www.inc.com/ilya-pozin/5-problems-most-entrepreneurs-face.html
4. https://www.inc.com/jessica-stillman/how-to-network-with-super-successful-people.html
5. https://www.entrepreneur.com/article/251603
6. https://seraf-investor.com/compass/article/understanding-crowdfunding

## COs/POs/PSOs Mapping

| CO'S | Program Outcomes (POs) | | | | | | | | | | | | Program Specific Outcomes (PSOs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| 1 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | - | - | 3 | - | 3 | 3 | 3 |
| 2 | 2 | 2 | 2 | 2 | - | 2 | - | 2 | - | 2 | - | 2 | 2 | 2 | - |
| 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | - | 3 | - | 3 | 3 | 3 |
| 4 | 2 | 2 | 2 | 2 | - | 2 | - | 2 | - | 2 | - | 2 | 2 | 2 | - |
| 5 | 2 | 2 | 2 | 2 | - | 2 | - | 2 | - | 2 | - | 2 | 2 | 2 | - |

**Correlation Level: 1 - Low, 2 - Medium, 3 – High**

2.A.3.25

| U20CSE824 | PERVASIVE COMPUTING | L | T | P | C | Hrs |
|---|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 3 | 45 |

**Course Objectives**

- To study the pervasive computing and its applications
- To study the pervasive computing web based applications
- To study voice enabling pervasive computing
- To study PDA in pervasive computing
- To study user interface issues in pervasive computing

**Course Outcomes**

*After completion of the course, the students will be able to*

**CO1** - Be able to learn pervasive computing devices and interfaces.

**CO2** - Be able to learn XML role in pervasive computing.

**CO3** - To get clear idea about WAP architecture and security.

**CO4** - Be able to learn speech application in pervasive computing.

**CO5** - Become familiar with different voice standards. Identify user interface issues in pervasive computing.

**UNIT I INFRASTRUCTURE** **(9 Hrs)**

Pervasive computing infrastructure-applications-Device Technology -Hardware, Human-machine Interfaces, Biometrics, and Operating systems–Device Connectivity –Protocols, Security, and Device Management

**UNIT II WEB BASED APPLICATIONS** **(9 Hrs)**

Pervasive Computing and web based Applications: - XML, XML Schema and DTD document definitions - XSLT transformations and programming - XML and its role in Pervasive Computing - Wireless Application Protocol (WAP) Architecture and Security - Wireless Mark-Up language (WML).

**UNIT III VOICE ENABLING PERVASIVE COMPUTING** **(9 Hrs)**

Voice Enabling Pervasive Computing: - Voice Standards - Speech Applications in Pervasive Computing and security. Middleware for Pervasive: Adaptive middleware, Context aware middleware, Mobile middleware, Service Discovery, Mobile Agents.

**UNIT IV PDA IN PERVASIVE COMPUTING** **(9 Hrs)**

PDA in Pervasive Computing: – Introduction - PDA software Components, Standards, emerging trends - PDA Device characteristics - PDA Based Access Architecture. Security in Pervasive Computing: Security and Privacy in Pervasive Networks, Experimental Comparison of Collaborative Defence Strategies for Network Security.

**UNIT V DESIGN OF PERVASIVE COMPUTING SYSTEMS** **(9 Hrs)**

Design of pervasive computing systems, The User Interface Design process- Obstacles, Usability, Human characteristics in Design, Human Interaction speeds, User Interface Issues in Pervasive Computing, Architecture: - Smart Card- based Authentication Mechanisms - Wearable computing Architecture.

2.A.3.20

## Text Books


1. JochenBurkhardt, Horst Henn, Stefan Hepper, Thomas Schaec& Klaus Rindtorff. "Pervasive Computing Technology and Architecture of Mobile Internet Applications", Addision Wesley, Reading, 2002.
2. Uwe Hansman, LothatMerk, Martin S Nicklous& Thomas Stober, "Principles of Mobile Computing", Second Edition, Springer- Verlag, New Delhi, 2003.
3. Jochen Burkhardt, "Pervasive Computing - Technology and Architecture of Mobile Internet Applications", 14th Edition, 2004.


## Reference Books


1. Rahul Banerjee, "Internetworking Technologies: An Engineering Perspective", Prentice –Hall of India, New Delhi, 2003. (ISBN 81-203-2185-5)
2. Rahul Banerjee,"Lecture Notes in Pervasive Computing", Outline Notes, BITS-Pilani, 2003.
3. Mohammad S. Obaidat, Mieso Denko, Isaac Woungang, "Pervasive Computing and Networking", 2011.
4. A. Genco and S. Sorce, "Pervasive Systems and Ubiquitous Computin", University of Palermo, 2010.
5. Varuna Godara, "Strategic Pervasive Computing Applications: Emerging Trends",Ist Edition, 2017.


## Web Resources

1. https://internetofthingsagenda.techtarget.com/definition/pervasive-computing-ubiquitous-computing
2. https://navveenbalani.dev/index.php/articles/the-complete-pervasive-computing-tutorial/
3. https://www.goodreads.com

**COs/POs/PSOs Mapping**

| COs | Program Outcomes(POs) | | | | | | | | | | | | Program Specific Outcomes(PSOs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| 1 | 3 | 3 | 3 | - | - | - | - | - | - | 2 | 2 | 2 | 1 | 2 | 2 |
| 2 | 3 | 3 | 3 | - | - | - | - | - | - | 2 | 2 | 2 | 1 | 2 | 2 |
| 3 | 3 | 3 | 3 | - | - | - | - | - | - | 2 | 2 | 2 | 1 | 2 | 2 |
| 4 | 3 | 3 | 3 | - | - | - | - | - | - | 2 | 2 | 2 | 1 | 2 | 2 |
| 5 | 3 | 3 | 3 | - | - | - | - | - | - | 2 | 2 | 2 | 1 | 2 | 2 |

**CorrelationLevel:1-Low,2-Medium,3-High**

9.A.3.27

| U20CSE826 | QUANTUM COMPUTING | L | T | P | C | Hrs |
|---|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 3 | 45 |

**Course Objectives**

- To explain the major concepts in Quantum computing
- To extend quantum circuits and algorithms
- To describe the building blocks of a quantum computer
- To understand the principles, quantum information and limitations of quantum operations formalism
- To discuss the quantum errors and its correction.

**Course Outcomes**

*Upon completion of the course, students shall have ability to*

CO1 - Outline the key concepts of Quantum computing
CO2 - Develop logic gate circuits and quantum algorithms
CO3 - List the various quantum computers
CO4 - Discover quantum noise and its operations
CO5 - Illustrate errors and corrections in quantum computing

**UNIT I FUNDAMENTAL CONCEPTS** **(9 Hrs)**

Global Perspectives, Quantum Bits, Quantum Computation, Quantum Algorithms, Quantum Information, Postulates of Quantum Mechanisms.

**UNIT II QUANTUM COMPUTATION** **(9 Hrs)**

Quantum Circuits – Quantum algorithms, Single Orbit operations, Control Operations, Measurement, Universal Quantum Gates, Simulation of Quantum Systems, Quantum Fourier transform, Phase estimation, Applications

**UNIT III QUANTUM COMPUTERS** **(9 Hrs)**

Guiding Principles, Conditions for Quantum Computation, Harmonic Oscillator Quantum Computer, Optical Photon Quantum Computer – Optical cavity Quantum electrodynamics, Ion traps, Nuclear Magnetic resonance

**UNIT IV QUANTUM INFORMATIONS** **(9 Hrs)**

Quantum noise and Quantum Operations – Classical Noise and Markov Processes, Quantum Operations, Examples of Quantum noise and Quantum Operations – Applications of Quantum operations

**UNIT V QUANTUM ERROR CORRECTION** **(9 Hrs)**

Introduction, Short code, Theory of Quantum Error –Correction, Constructing Quantum Codes, Stabilizer codes, Fault – Tolerant Quantum Computation, Entropy and information – Shannon Entropy, Basic properties of Entropy, Von Neumann, Strong Sub-Additivity, Data Compression, Entanglement as a physical resource

**Text Books**


1. Bennett C.H., Bernstein E., Brassard G., Vazirani U., "The strengths and weaknesses of quantum computation" SIAM Journal on Computing,2016.
2. Phillip Kaye Raymond Laflamme Michele Mosca, "An Introduction to Quantum Computing", Oxford University Press, 2007.


2.A.3.28

## Text Books


1. Xujan Zhou, YueXu, Yuefeng Li, Audun Josang, and Clive Cox, "The state of-the-art in personalized recommender systems for social networking. Artificial Intelligence Review", Issue C, pp.1-14, Springer, 2011.
2. Challener D., Yoder K., Catherman R., Safford D., Van Doorn L. "A Practical Guide to Trusted Computing", IBM press, 2008.
3. Sean W. Smith, "Trusted Computing Platforms: Design and Applications", Springer Science and Business media, 2005.


## Reference Books


1. Dengguo Feng, "Trusted Computing" Tsinghua University Tsinghua University Press Released December Publisher(s): De Gruyter, 2017.
2. A Practical Guide to Trusted Computing (IBM Press), December 2007.
3. Trusted Computing Platforms Design and Applications, 2005.
4. Trusted Computing Platforms: TCPA Technology in Context by Pearson Education , July 2002.
5. John Linn, "Trust Models and management in Public Key Infrastructures", November 2000.


## Web Resources

1. https://trustedcomputinggroup.org/
2. https://en.wikipedia.org/wiki/Trusted_Computing
3. https://www.techopedia.com/definition/16523/trusted-computing
4. https://webstore.ansi.org/industry/software/encryption-cryptography
5. https://csrc.nist.rip/Projects/Cryptographic-Standards-and-Guidelines.

**COs/POs/PSOs Mapping**

| COs | Program Outcomes (POs) | | | | | | | | | | | | Program Specific Outcomes (PSOs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1 | PSO 2 | PSO 3 |
| 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | 2 | 3 | - | 3 | 3 | 3 |
| 2 | 3 | 3 | 3 | 3 | - | 3 | - | 3 | - | 2 | - | 2 | 2 | 2 | - |
| 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | - | 3 | 3 | - | 2 | 2 | 2 |
| 4 | 2 | 2 | 2 | 2 | 2 | 2 | - | 3 | - | 3 | - | 3 | 3 | 3 | - |
| 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | 3 | 3 | 3 | 3 | 3 | 3 |

**CorrelationLevel:1-Low,2-Medium,3-High**

| | L | T | P | C | Hrs |
|---|---|---|---|---|---|
| **CLIENT SERVER COMPUTING** | **3** | **0** | **0** | **3** | **45** |

**U20CSE828**

## Course Objectives

- Comprehend the basic concepts of the client-server model
- Describe how the hardware and software are combined to implement client/server computing.
- To expose terminology, concepts and types of servers in client/server architecture.
- Explore the different server operating systems and its components
- Explore about the Impact of Technology & Training and Testing Technology

## Course Outcomes

*After completion of the course, the students will be able to*

**CO1** - Understand and analyze about the history of C/S computing.

**CO2** - Analyze the different client/server models.

**CO3** - Be familiar with the types, features and components of Server in C/S systems.

**CO4** - Analyze the different server operating systems and its components.

**CO5** - Known about the impact of Technology, Training and Testing Technology.

## UNIT I INTRODUCTION TO CLIENT/SERVER COMPUTING (9 Hrs)

Introduction to client/server computing-What is client/server computing-Benefits of client/server computing-Evolution of C/S computing-Hardware trends-Software trends-Evolution of operating systems-Networking (N/W) trends-Business considerations.

## UNIT II CLASSIFICATION OF CLIENT / SERVER SYSTEMS (9 Hrs)

**Two-tire client / Server Model:** Hardware and Software Requirements operating system services – Types of clients – Server tier.

**Three- Tier client / Server Model**: Hardware and Software Requirements – Netware connectivity – Types of Middleware – Database Middleware.

**N- Tier client / Server Model**:Overview – Benefits – Disadvantages – Components – Tier separations and interaction.

**Middleware:** Importance-Types-benefits -disadvantages

## UNIT III SERVERS (9Hrs)

Server -Types of server- Hardware, Categories - Features classes of Server Machines - Server Environment - Network management environment - network Computing Environment - Network Operating Systems - Server requirements, Platform Independence - Transaction Processing and Connectivity - Server Data Management and Access Tools

## UNIT IV SERVER OPERATING SYSTEM (9Hrs)

Server operating system: OS/2 2. 0-Windows new technology-Unix based OS-Server requirements: Platform independence-Transaction processing-Connectivity-Intelligent database-Stored procedure-Triggers-Load leveling-Optimizer-Testing and diagnostic tools – Backup&recovery mechanisms.

## UNIT V IMPACT OF TESTING TECHNOLOGY (9Hrs)

**(9Hrs)**

Client / Server Administration and Management – Client /Server Software – Testing techniques – Testing aspects – Measures of Completeness – Testing Client / Server Application.

2.A.3.30

## Text Books


1. Munesh Chandra Trivedi,"Client/Server Computing", Khanna Book Publishing Company, Second edition,2014.
2. Chandra YadavSubhash, "Introductions to Client Server Computing", New Age International, 2009.
3. Dawana Travis Dewire, "Client/Server Computing", Tata McGraw-Hill Publishing Company Limited, New Delhi, 2003.


## Reference Books


1. Dr. S.T. Deepa, Mrs.T.Yegammai,"Client Server Computing", Charulatha Publications Private Limited, 2019.
2. Patrick Smith, Steve Guengerich," Client/Server Computing, Prentice Hall India Learning Private Limited, 2nd edition, 2011.
3. Robert Orfali, Dan Harkey and Jeri Edwards, "Essential Client/Server SurvivalGuide", Galgotia Publications, New Delhi, 2001.
4. Joel P Kaster, "Understanding Thin Client/Server Computing", Prentice Hall of India, New Delhi, 2001.
5. Karen Watterson, "Client/Server Technology for Managers ", Addition-Wesley, USA, 1996.


## Web Resources

1. http://www.studentshangout.com/topic/142825-client-server-computing-notes
2. http://www.slideshare.net/jayasreep3/client-servercomputing
3. http://www.infomotions.com/musings/waves/clientservercomputing.html
4. https://teachcomputerscience.com/client-server-architecture/
5. https://nptel.ac.in/content/storage2/courses/106105087/pdf/m17L41.pdf

**COs/POs/ PSOs Mapping**

| COs | Program Outcomes(POs) | | | | | | | | | | | | Program Specific Outcomes(PSOs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| 1 | 3 | 3 | 2 | 3 | 3 | 3 | 1 | - | - | 2 | 2 | - | 3 | 3 | 3 |
| 2 | 2 | 3 | 2 | 3 | 3 | 1 | 1 | - | - | 2 | 2 | - | 3 | 3 | 3 |
| 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | - | - | 2 | 2 | - | 3 | 3 | 3 |
| 4 | 2 | 2 | 3 | 3 | 3 | 2 | 1 | - | - | 2 | 2 | - | 2 | 2 | 3 |
| 5 | 3 | 2 | 3 | 3 | 3 | 3 | 1 | - | - | 2 | 2 | - | 2 | 2 | 2 |

**Correlation Level: 1-Low, 2-Medium, 3-High**

# ANNEXURE – III

2.A.3.32

# SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)

(Accredited by NBA-AICTE, New Delhi, ISO 9001:2000 Certified Institution & Accredited by NAAC with "A" Grade)

Madagadipet, Puducherry - 605 107

## Department of Computer Science and Engineering

## Details of Examiners for Question Paper Setter and Evaluators

| Sl.No | Name of the Examiner | Specialization | Designation, Department and Institution in which currently working | Contact number and mail |
|---|---|---|---|---|
| 1 | **Dr. K. RAJA** | **Computer Graphics, Computer Networks, Multimedia** | Assistant Professor / IT, Annamalai University, Chidambaram | 9894304053, rajak_cdm@yahoo.co.in |
| 2 | Dr.B.MURUGANANTHAM | **Artificial Intelligence, Service Oriented Architecture, Webservices** | Associate .Professor / CSE SRM Institute of Science and Technology, Chennai. | 9940023373, muruganb@srmist.edu.in |
| 3 | Dr. V.TAMIZHAZHAGAN | Wireless Networks | Assistant Professor / IT, Annamalai University, Chidambaram | 8925122220 rvtamizh@gmail.com |
| 4 | Dr. D. JAGANATHAN | Artificial Intelligence, Computer Networks | Assistant Professor / CSE, Vel Tech Rangarajan Dr. Sagunthala R & D institute of Science and Tecnology, Chennai | 9994524148 djagannathan@veltech.edu.i |
| 5 | Mr. V. PRABHU | DBMS, Data Structures | Assistant Professor / CSE, Vel Tech Rangarajan Dr. Sagunthala R & D | 9597739629 vprabhu@veltech.edu.in |

9.A.3.33

| | | | | |
|---|---|---|---|---|
| | | | institute of Science and Tecnology, Chennai | |
| 6 | Dr. LAKSHMI DHEVI | Internet of Things, Compute Organization, Computer Graphics | Assistant Professor / CSE, Vel Tech Rangarajan Dr. Sagunthala R & D institute of Science and Tecnology, Chennai | 9551145796 blakshmidhevi@veltech.edu. |
| 7 | Dr.MANJUNATHAN | Database Management Systems, Operating Systems | Assistant Professor / CSE, Vel Tech Rangarajan Dr. Sagunthala R & D institute of Science and Tecnology, Chennai | 9791060024 nmanjunathan@veltech.edu. |
| 8 | Dr. A. RAMACHANDRAN | Digital Design, Computer Design, Web Technology | Assistant Professor and Head (i/c), Department of Computer Science and Engineering, University College of Engineering, Panruti. | 9790900771 ramautpc@gmail.com, ram@ucep.edu.in |
| 9 | Dr. C. NAVANEETHAN | Java, Python, Artificial Intelligence, Data Structures | Associate Professor / CSE Department of Software and Systems Engineering, School of Information Technology & Engineering, VIT, Vellore - 632014 | 9962327007 navaneethan.c@vit.ac.in |
| 10 | Dr. G. GUNASEKARAN. | Artificial Intelligence, AR & VR, Compiler Design | Associate Professor / CSE Department of Smart Computing, School of Information Technology & Engineering, VIT, Vellore - 632014 | 9443049982 ggunasekaran@vit.ac.in |
| 11 | Dr. AMRITHA SARAVANAN | Data Structures, Operating Systems | Associate Professor / CSE Department of CSE, University college of Engineering, Villupuram | 9791555778 aasaravanan777@gmail.cor |

2.A.3.34

| | | | | |
|---|---|---|---|---|
| 12 | Dr. BALAJI. N | Computer Networks, Cloud Computing | Professor and Head, Department of CSE, Sri Venkateswara College of Engineering and Technology, Puducherry. | 9944199803<br>nbalajime1983@gmail.com |

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# ANNEXURE IV

2.A.3.36

SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE
(An Autonomous Institution)
(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi, ISO 9001:2000 Certified Institution &
Accredited by NAAC with "A" Grade)
Madagadipet, Puducherry - 605 107

Department of Computer Science and Engineering

# ANNEXURE IV

## List of Ph.D Candidates

| S.No | Name of the Candidate | Supervisor | Mode |
|---|---|---|---|
| 1. | Mrs.P.Bhavani | Dr.A.Ramalingam | Part-Time-Internal |
| 2. | Mr.Arokiaraj St.Hubert | Dr.J.Madhusudanan | Part-Time-Internal |
| 3. | Mr.S.Diwahar | Dr.J.Madhusudanan | Part-Time-External |
| 4. | Mr.G.Aurobind | Dr.R.Ramachandiran | Part-Time-External |
| 5. | Ms.T.Prateesshma | Dr.R.Raju | Regular |

# ANNEXURE V

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# SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)

(Accredited by NBA-AICTE, New Delhi, ISO 9001:2000 Certified Institution & Accredited by NAAC with "A" Grade)

Madagadipet, Puducherry - 605 107

**Department of Computer Science and Engineering**


## ANNEXURE V

## List of Doctoral Committee Members

| S.No | Name of the Candidate | Supervisor | Doctoral Committee Members |
|---|---|---|---|
| 1. | Mrs.P.Bhavani<br>Part-Time-Internal | Dr.A.Ramalingam | Dr.J.Madhusudanan<br>Professor and Head,<br>Department of Artificial Intelligence &Data Science,<br>Sri Manakula Vinayagar Engineering College |
| | | | Dr.T.Vengattaraman,<br>Associate Professor,<br>Department of Computer Science,<br>Pondicherry University |
| | | | Dr.S.Ganesh Kumar,<br>Professor,<br>Department of DS & BS<br>SRM Institute of Science and Technology |
| 2. | Mr.Arokiaraj St.Hubert<br>Part-Time-Internal | Dr.J.Madhusudanan | Dr.A.Ramalingam,<br>Professor and Head,<br>Department of MCA,<br>Sri Manakula Vinayagar Engineering College |
| | | | Dr.A.Martin,<br>Assistant Professor,<br>Department of Computer Science<br>Central university of Thiruvarur, |
| | | | Dr.P.Boobalan<br>Associate Professor,<br>Department of Information Technology,<br>Puducherry Technological University |
| 3. | Mr.S.Diwahar<br>Part-Time-External | Dr.J.Madhusudanan | Dr.V.Prasanna Venkatesan<br>Professor and Head,<br>Department of Banking Technology,<br>Pondicherry University |

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| | | | |
|---|---|---|---|
| | | | Dr.P.Thiyagarajan<br>Assistant Professor,<br>Rajiv Gandhi National Institute of Youth Development, Sriperumbudur |
| | | | Dr.R.Raju,<br>Professor and Head,<br>Department of Information Technology,<br>Sri Manakula Vinayagar Engineering College |
| 4. | Mr.G.Aurobind<br>Part-Time-External | Dr.R.Ramachandiran | Dr. V. Bharathi<br>Associate Professor,<br>Department of CCE,<br>Sri Manakula Vinayagar Engineering College |
| | | | Dr. P . Victer Paul.<br>Assistant Professor,<br>Department of Computer Science and Engineering,<br>Indian Institute of Information Technology Kottayam |
| | | | Dr. Jagadeesh kakarla<br>Assistant Professor<br>Department of Computer Science and Engineering,<br>Indian Institute of Information Technology Design and Manufacturing Kancheepuram |
| 5. | Ms.T.Prateesshma<br>Regular | Dr.R.Raju | Dr.P.Raja<br>Professor and Head,<br>Department of ECE<br>Sri Manakula Vinayagar Engineering College |
| | | | Dr.T.Vengattaraman,<br>Associate Professor,<br>Department of CS,<br>Pondicherry University |
| | | | Dr.N.Sivakumar<br>Associate Professor,<br>Department of CSE,<br>Puducherry Technological University |

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| U20CSE827 | TRUSTED COMPUTING | L | T | P | C | Hrs |
|---|---|---|---|---|---|---|
| | | 3 | 0 | 0 | 3 | 45 |

**Course Objectives**

- To design the goals in the trusted platforms.
- To understand the comprehensive overview of the trust architecture and its applications.
- To experiment with TCG and to implement different tools.
- To demonstrate different encryption algorithms for security purposes.
- To learn about the trusted devices and their maintenance.

**Course Outcomes**

*After completion of the course, the students will be able to*

**CO1 –** Summarize the concept of trust categories.
**CO2 –** Demonstrate trust architecture and formalization of security architecture.
**CO3 –** Analyse about the TPM and TCG.
**CO4 –** Understand about the cryptographic standards.
**CO5 –** Summarize trusted computing and its administration.

**UNIT I INTRODUCTION TO TRUST COMPUTING (9Hrs)**

Introduction – Trust and Computing – Instantiations – Design and Applications – Progression – Motivating scenarios – Attacks. Design goals of the trusted platform modules. Introduction to simulators – Implementation of attacks.

**UNIT II TRUST ARCHITECTURE (9Hrs)**

Foundations – Design challenges – Platform Architecture – Security architecture – erasing secrets – sources – software threats – code integrity and code loading. Outbound Authentication – Problem – Theory – Design and Implementation - Validation – Process – strategy – Formalizing security properties – Formal verification – other validation tasks – reflection.

**UNIT III TCG TCPA (9Hrs)**

Programming Interfaces To TCG. Experimenting with TCPA/TCG – Desired properties- Lifetime mismatch – Architecture – Implementation – Applications. Writing a TPM device driver- Low level software – Trusted boot – TCG software stack – Using TPM keys-TPM tools- Implementation using simulator tools.

**UNIT IV CRYPTOGRAPHIC STANDARDS (9Hrs)**

TSS core service – Public key cryptography standard – Architecture – Trusted computing and secure storage – Linking to encryption algorithms – encrypting files and locking data to specific PCs-content protection – secure printing and faxing. Simulation analysis of symmetric and public key cryptographic standards - performance evaluation of these trust models.

**UNIT V ADMINISTRATION OF TRUSTED DEVICES (9Hrs)**

Trusted Computing And Secure Identification Administration of trusted devices – Secure /backup maintenance – assignment of key certificates-secure time reporting-key recovery –Ancillary hardware.

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3. Micheal A. Nielsen and Issac L. Chiang, "Quantum Computation and Quantum Information", Cambridge University Press, Fint South Asian Edition, 2002.

## Reference Books

1. Nayak, Chetan; Simon, Steven; Stern, Ady; Das Sarma, Sankar, "Nonabelian Anyons and Quantum Computation", 2008.
2. Clarke, John; Wilhelm, Frank, "Superconducting quantum bits", 2008.
3. William M Kaminsky, "Scalable Superconducting Architecture for Adiabatic Quantum Computation", 2004.
4. V. Sahni, "Quantum Computing", Tata McGraw-Hill Publishing Company, 2007.
5. P. Kaye, R. Laflamme, and M. Mosca, "An introduction to Quantum Computing", Oxford University Press, 1999.

## Web Resources

1. https://nptel.ac.in/courses/115101092/Quantumcomputation.
2. https://nptel.ac.in/courses/104104082/Quantumcomputing and information.
3. https://www.futurelearn.com/courses/intro-to-quantum-computing.

**COs/POs/ PSOs Mapping**

| COs | ProgramOutcomes(POs) | | | | | | | | | | | | Program SpecificOutcomes(PSOs) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| 1 | 3 | 2 | 2 | - | - | - | - | - | - | 2 | 2 | - | 3 | 2 | 3 |
| 2 | 3 | 2 | 2 | - | - | - | - | - | - | 2 | 2 | - | 3 | 2 | 3 |
| 3 | 3 | 2 | 2 | - | - | - | - | - | - | 2 | 2 | - | 3 | 2 | 3 |
| 4 | 3 | 2 | 2 | - | - | - | - | - | - | 2 | 2 | - | 3 | 2 | 3 |
| 5 | 3 | 2 | 2 | - | - | - | - | - | - | 2 | 2 | - | 3 | 2 | 3 |

**CorrelationLevel:1-Low,2-Medium,3-High**

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