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40 YEARS OF ACADEMIC WISDOM

Itgalpur, Rajankunte, Yelahanka, Bengaluru – 560064

SCHOOL OF ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Ref: PU-SOE-CSE/2021-2022/BOS-13/CIR-01   Date: 08-12-2021

13th BOS MEETING NOTICE

The 13th Board of Studies (BOS) meeting of Department of Computer Science and Engineering, SOE is convened on Wednesday, 08th December, 2021, at 2:30 PM, online hosted from Presidency University Campus Itgalpur, Rajankunte, Yelahanka, Bengaluru.

Kindly make it convenient to attend the meeting.

Agenda:

SOE-CSE 13.1: To approve the minutes of 12th Board of Studies Meeting held on 4th August, 2021.

SOE-CSE 13.2: To consider and approve the changes in Curriculum for SOE-CSE 2020 Batch programs.

       --- To consider and approve introduction of new courses
1. Data Structure and Algorithms
2. Introduction to the Go Programming Language
3. Application of Probability Theory in Computer Science

SOE-CSE 13.3: To consider and approve the revised CBCS Course grid and the Course catalogues for the SOIS-CSE 2021 batch B.Sc Programs.
       -- B.Sc [Data Science]

SOE-CSE 13.4.1: To approve the Course Catalogues for SOIS-CSE 2021 Batch B.C.A programs
       -- B.C.A [General]
       -- B.C.A [Augmented Reality & Virtual Reality]
       -- B.C.A [Gaming & Graphics]

SOE-CSE 13.4.2: To approve the Course Descriptions for SOIS-CSE 2020 Batch B.C.A programs
       -- B.C.A [Augmented Reality & Virtual Reality]
       -- B.C.A [Gaming & Graphics]

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SOE-CSE 13.4.3: To consider and approve the course description for SOIS-CSE 2019 Batch B.C.A Programs
-- B.C.A [General]

SOE-CSE 13.5: Any other matter with the permission of the chair.

Chairperson
BOS-CSE Committee

Copy to:
- Pro-Chancellor, PU
- Registrar, PU
- Dean-SoE, PU

- Vice-Chancellor, PU
- Pro-Vice-chancellor, PU
- Dean-Academics, PU

- Members of the BOS-CSE Committee:

1	Dr. Abdul Sharief	9	Prof. Isaac Joel Raj. S
2	Dr. Jacob Augustine	10	Dr. Chandrasekhar Gorikanthu, Practice Head, Wipro
3	Dr. Kalaiarasan C	11	Dr. Keshava Munegowda, Vice President, Goldman Sachs
4	Dr. Mohamadi Begum	12	Mr. Ganesh Mahadevan, Head of Enterprise IT and Digital Transformation, BOSCH
5	Dr. C. Shankar Ramamoorthy	13	Prof. R. B. V. Subramaanyam, Professor, Dept. of CSE, National Institute of Technology, Warangal
6	Dr. T. K. Thivakaran	14	Dr. K. Rajanikanth, Former Principal, MSRIT
7	Dr. Deepak Sakkari	15	Dr. Hari Seetha, Professor and Director, COE in AI and Robotocs, VIT-AP University
8	Dr. Tapas Guha	16	Dr. Mohan K G, Professor, Dept. of CSE, Geetam University

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SCHOOL OF ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Ref: PU-SOE-CSE/2021-2022/BOS-13/MOM-01   Date: 08-12-2021

Minutes of the 13th Meeting of Board of Studies (Computer Science and Engineering – BOS – CSE)

The 13th meeting of Board of Studies (BOS) of the Computer Science and Engineering has been held on 8th December, 2021 at 02:30 PM, online.

The following members were present:

S. No.	Name	Designation with Affiliation	Status
1	Dr. Abdul Sharief	Dean, School of Engineering, Presidency University	Chairman
2	Dr. Kalaiarasan C	Associate Dean & Professor, Dept. of CSE, Presidency University	Member
3	Dr. C. Shankar Ramamoorthy	Professor, Dept. of CSE, Presidency University	Special Invitee
4	Dr. T. K. Thivakaran	Program Chair & Professor, Dept. of CSE, Presidency University	Special Invitee
5	Dr. Deepak Sakkari	Program Chair & Assistant Professor, Dept. of CSE, Presidency University	Special Invitee
6	Prof. Isaac Joel Raj. S	Program Chair & Assistant Professor, Dept. of CSE, Presidency University	Special Invitee
7	Dr. Tapas Guha	Assistant Professor, CSE, Dept. of CSE, Presidency University	Special Invitee
8	Dr. Chandrasekhar Gorikanthu	Practice Head, Wipro	Senior Professional
9	Dr. Keshava Munegowda	Vice President, Goldman Sachs	Senior Professional
10	Dr. Ganesh Mahadevan	Chief Information Officer, BOSCH	Senior Professional
11	Prof. R. B. V. Subramaanyam	Professor, Dept. of CSE, National Institute of Technology, Warangal	External Expert
12	Dr. K. Rajanikanth	Former Principal, MSRIT, Bangalore	External Expert

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13	Dr. Hari Seetha	Professor and Director, COE in AI and Robotocs, VIT-AP University	External Expert
14	Dr. Mohan K G	Professor, Dept. of CSE, Gitam University	External Expert
15	Dr. Jacob Augustine	Associate Dean & Professor, Dept. of CSE, Presidency University	Member Secretary

The following members are given leave of absence:

Sr. No.	Name	Designation
1	Dr. Chandrasekhar Gorikanthu	Practice Head, Wipro
2	Dr. Keshava Munegowda	Vice President, Goldman Sachs
3	Dr. Ganesh Mahadevan	Chief Information Officer, BOSCH

The Chairman welcomed the Members and all the members were formally introduced to each other.

Agenda SOE-CSE 13.1: To approve the minutes of 12th Board of Studies Meeting held on 4th September 2020.

The minutes of the 12th meeting of the Board of Studies of Computer Science and Engineering held on 4th August 2021 was placed before the members and the same was unanimously approved (**Annexure CSE 13.1**).

Agenda SOE-CSE 13.2.1: To consider and approve the changes in Program Regulations and Curriculum for SOE-CSE programs

The members were presented with the following changes.

- Inclusion of new courses

Sl No.	Course Code	Course Name	Credits
1	CSE2001	Data Structures and Algorithms	3
2	CSEXXXX	Introduction to the Go Programming Language	3
3	CSEXXXX	Application of Probability Theory in Computer Science	3

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The course catalogues were presented before the members (**Annexure CSE 13.2**). The members discussed the same at length.

Resolution: Resolved that the inclusion of the new courses are approved with the following suggestion.

- The course Application of Probability Theory in Computer Science is well designed, but the contents are little heavy for a 3 credit course. A fundamental course on Statistics can be offered before this one.

Agenda SOE-CSE 13.3.1: To consider and approve the revised CBCS Course grid for the SOIS-CSE 2021 batch B.Sc Program.

-- B.Sc [Data Science]

The revised CBCS course grid (**Annexure CSE 13.3.1**) for the SOIS-CSE 2021 batch B.Sc Program were presented before the members.

Resolution: The proposed revision is approved with the following suggestions.

- In the Mathematics Basket few courses do not have much relevance with data Science. Course like Vector Space and Vector Calculus should have already been covered in Linear Algebra
- Topics like Matrix spaces, topology and Measurement Theory may be included in the curriculum
- A course on Nonlinear Optimization Technique should be included

Agenda SOE-CSE 13.3.2: To consider and approve the course catalogues for the SOIS-CSE 2021 batch B.Sc Program.

-- B.Sc [Data Science]

The catalogues (**Annexure CSE 13.3.2**) of the following courses for the SOIS-CSE 2021 batch B.Sc Program were presented before the members.

S.No.	COURSE CODE	COURSE NAME	CREDITS		
			L	P	C
1	BSD1001	Introduction to Statistics	3	0	3
2	BSD1004	Elements of Computing Systems	3	0	3

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3	BSD1006	Fundamentals of Data Science	2	2	3
4	BSD1007	Programming in Python	1	4	3
5	BSD1009	Fundamental Calculus	3	0	3
6	ENG1003	Communicative English	2	0	2
7	KAN1001	Kali Kannada	1	0	1
8	KAN2001	Tili Kannada	1	0	1
9	PPS1001	Introduction to soft skills	0	2	1
10	MAT1008	Descriptive Statistics	2	0	2
11	BSD1003	Programming in C	1	4	3
12	MAT1009	Linear Algebra	2	0	2
13	BSD2001	Data Structures and Algorithms	2	2	3
14	BSD2002	Data Modelling and visualization	2	2	3
15	MAT2023	Matrix Computation for Data science	2	2	3
16	ENG1004	Essentials of English	2	0	2
17	PPS1002	Softskills for Engineers	0	2	1

Resolutions: The proposed catalogues were approved with the following suggestion.

-The module 4 of the course Fundamentals of Data Science (BSD 1006) is scattered with many concepts which are again going to be repeated in Machine Learning course. This module may specifically introduce supervised learning techniques like Bayesian learning, K means, Bandit Queen Problem etc. If possible attempt should be made to demonstrate the working of some of these concepts practically

Agenda SOE-CSE 13.4.1: To approve the Course Catalogues for SOIS-CSE 2021 Batch B.C.A programs

-- B.C.A [General]
-- B.C.A [Augmented Reality & Virtual Reality]
-- B.C.A [Gaming & Graphics]

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The Catalogues (**Annexure CSE 13.4.1**) of following courses for SOIS-CSE 2021 Batch B.C.A programs were presented before the members

S.No.	COURSE CODE	COURSE NAME	CREDITS		
			L	P	C
1	BCA1007	Basic Electronics and Computer Hardware	2	2	3
2	BCA2001	Problem Solving using C	2	4	4
3	BCA2005	Digital Integrated Circuits	2	2	3
4	BSD1006	Fundamentals of Data Science	2	2	3
5	BCA1009	Preproduction Techniques	1	2	2
6	BCA2056	Stop motion Animation	0	2	1
7	MAT1006	Statistical Methods and Techniques	3	0	3
8	ENG1003	Communicative English	2	0	2
9	PPS1001	Introduction to Softskills	0	2	1
10	DES1001	Sketching and Painting	0	2	1
11	BCA1007	Basic Electronics and Computer Hardware	2	2	3
12	BCA2001	Problem Solving using C	2	4	4
13	BCA2005	Digital Integrated Circuits	2	2	3
14	BSD1006	Fundamentals of Data Science	2	2	3
15	BCA1009	Preproduction Techniques	1	2	2
16	BCA2056	Stop motion Animation	0	2	1
17	MAT1006	Statistical Methods and Techniques	3	0	3
18	ENG1003	Communicative English	2	0	2
19	PPS1001	Introduction to Softskills	0	2	1

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20	DES1001	Sketching and Painting	0	2	1

Resolution: The proposed catalogues were unanimously approved.

Agenda SOE-CSE 13.4.2: **To approve the Course descriptions for SOIS-CSE 2020 Batch B.C.A programs**

-- B.C.A [Augmented Reality & Virtual Reality]

-- B.C.A [Gaming & Graphics]

The Course Catalogues (**Annexure CSE 13.4.2**) for SOIS-CSE 2021 Batch B.C.A programs were presented before the members

B.C.A [Augmented Reality & Virtual Reality]

S.No.	COURSE CODE	COURSE NAME	CREDITS		
			L	P	C
1	BCA258	Augumented Reality Development	1	4	3
2	BCA223	3D and VR workflows and Theories	3	0	3
3	BCA274	Character and Environment design in Game Engine	1	4	3
4	BCA313	Image Processing	2	2	3
5	BCA208	Computer Networks	3	0	3
6	BCA273	Programming for Augumented and Virtual Reality	2	4	4
7	BCA259	Video and Audio for Games	2	2	3
8	PPD132	Personal and Professional Development -II	0	2	0

B.C.A [Gaming & Graphics]

S.No.	COURSE CODE	COURSE NAME	CREDITS		
			L	P	C

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1	BCA265	2D game design and development	2	4	4
2	BCA266	Game Mechanics and dynamics	3	0	3
3	BCA313	Image Processing	2	2	3
4	BCA208	Computer Networks	3	0	3
5	BCA217	Artificial Intelligence for Gaming	3	0	3
6	BCA259	Video and Audio for Games	2	2	4
7	BCA272	Game Programming	2	4	3
8	PPD132	Personal and Professional Development -II	0	2	0

Resolution: The proposed course descriptions were unanimously approved.

Agenda SOE-CSE 13.4.3: To consider and approve the course descriptions for SOIS-CSE 2019 **Batch B.C.A Programs**
          B.C.A [General]

The members were presented with the descriptions (**Annexure CSE 13.4.3**) of the following courses.

S.No.	COURSE CODE	COURSE NAME	CREDITS			
			L	T	P	C
1	BCA 309	Web Data Mining	3	0	0	3
2	BCA 312	Parallel Computing	3	0	0	3
3	BCA 313	Image Processing	1	0	4	3
4	BCA 318	Internet of Things	1	0	4	3

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Resolution: The members discussed the proposed revisions and approved the same with the following suggestions.

- For the courses Web Data Mining (BCA 309) and Parallel Computing (CSE 312), the feasibility of integrating some lab components may be considered

Agenda SOE-CSE 13.5: Any other matter with the permission of the Chair

- **Approval of replacement of Core Course Digital Entrepreneurship**

Resolution: The members authorized the Chairman to incorporate the necessary changes.

As BOS meetings for all the departments are taking place, the Chairman has requested approval from the committee to incorporate modifications / alterations, if any, approved by the BOS committee of other departments for the existing courses offered in Computer Science and Engineering by other departments. The BOS Committee for Computer Science and Engineering has approved the proposal unanimously. The BOS Committee authorizes the Chairperson of the BOS to formulate a sub-committee for making any minor modifications required in the program curriculum and seek the approval in the next meeting.
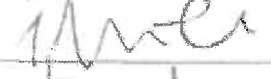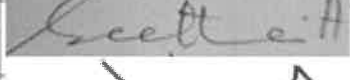
The BOS Chairperson has conveyed that the decisions taken during the 13th meeting of BOS for Computer Science and Engineering will be implemented for 2021-2025, 2020-2024, 2019-2023, and 2018-2022 as early as possible wherever applicable. He has conveyed thanks to all the members and informed that the date of next BOS meeting will be notified soon.

The meeting ended with Vote of Thanks to the Chair.

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BOS Committee:

S. No.	Name	Status	Signature
1	Dr. Abdul Sharief	Chairman	
2	Dr. Kalaiarasan C	Member	
3	Dr. C. Shankar Ramamoorthy	Special Invitee	
4	Dr. T. K. Thivakaran	Special Invitee	
5	Dr. Deepak Sakkari	Special Invitee	
6	Prof. Isaac Joel Raj. S	Special Invitee	
7	Prof. Tapas Guha	Special Invitee	
8	Dr. Chandrasekhar Gorikanthu	Senior Professional	
9	Dr. Keshava Munegowda	Senior Professional	
10	Dr. Ganesh Mahadevan	Senior Professional	
11	Prof. R. B. V. Subramaanyam	External Expert	
12	Dr. K. Rajanikanth	External Expert	
13	Dr. Hari Seetha	External Expert	
14	Dr. Mohan K G	External Expert	
15	Dr. Jacob Augustine	Member Secretary	

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SCHOOL OF INFORMATION SCIENCE

CURRICULUM STRUCTURE
based on Choice Based Credit System (CBCS) and Outcome Based Education (OBE)

Program: BACHELOR OF SCIENCE

B.Sc. [DATA SCIENCE]

2021-2024

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Name of the Program: B.Sc. [BACHELOR OF SCIENCE - DATA SCIENCE]

Sl. No.	Course Code	Course Name	L	P	Credits	Basket
Semester 1					19	
1	MAT1007	Introduction to Statistics	3	0	3	School Core
2	BSD1004	Elements of Computing Systems	3	0	3	Program Core
3	BSD1006	Fundamentals of Data Science	2	2	3	Program Core
4	BSD1007	Programming in Python	1	4	3	School Core
5	MAT1010	Fundamental Calculus	3	0	3	Program Core
6	ENG1003	Communicative English	2	0	2	School Core
7	KAN1001/ KAN2001	Kali Kannada / Tili Kannada	1	0	1	School Core
8	PPS1001	Introduction to soft skills	0	2	1	School Core
Semester 2					22	
1	MAT2007	Applied Mathematics	3	0	3	School Core
2	MAT1008	Probability and Inferential Statistics	3	0	3	Program Core
3	BSD1002	Programming in C	1	4	3	Program Core
4	BCA2002	Data structures and Algorithms	3	2	4	Program Core
5	BSD2002	Data Modelling and visualization	2	2	3	Program Core
6	BCA2011	Web Design and Development	1	4	3	Program Core
7	ENG1005	Technical Written Communication	2	0	2	School Core
8	PPS1006	Employability for Young Professionals	0	2	1	School Core
Semester 3					20	
1	CSA2003	Relational Database Management systems	2	4	4	Program Core
2	MAT2023	Matrix Computations for Data Science	3	0	3	Program Core
3	CSA1006	Operating Systems and Unix Programming	2	2	3	Program Core
4	CSA1005	Object oriented Programming Using Java	1	4	3	Program Core
5	CSA2020	Artificial Intelligence	3	0	3	Program Core
6	CSA2019	R Programming for Data science	2	2	3	Program Core
7	PPS2001	Reasoning and Employment Skills	0	2	1	School Core
Semester 4					20	
1	MAT2028	Graph Theory	3	0	3	Program Core
2	CSAXXXX	Discipline elective – I	3	0	3	Discipline Elective
3	CSA2021	Data Warehousing and Data mining	3	0	3	Program Core
4	CSAXXXX	Discipline elective – II	3	0	3	Discipline Elective
5	CSA2006	Fundamentals of Software Engineering	3	0	3	Program Core

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6	CSA3001	Capstone Project	-	-	4	School Core
7	CHE1018	Environment Science	1	2	0	School Core
8	PPS3001	Problem Solving through Aptitude	0	2	1	School Core
Semester 5					**20**	
1	CSA3002	Machine Learning Algorithms	2	2	3	Program Core
2	CSA3004	Big data analytics	2	2	3	Program Core
3	CSA3003	Android Mobile Application Development	1	4	3	Program Core
4	CSA3014	Natural Language Processing	1	2	2	Program Core
5	CSA2008	Essentials of Cloud Computing	3	0	3	Program Core
6	CSAXXXX	Discipline elective – III	3	0	3	Discipline Elective
7	XXX XXXX	Open Elective – I	3	0	3	Open Elective
Semester 6					**19**	
1	CSA3005	Internet of Things	1	4	3	Program Core
2	CSA3017	Information Retrieval	1	2	2	Program Core
3	XXX XXXX	Open Elective – II	3	0	3	Open Elective
4	CSAXXXX	Discipline Elective 4: Deep Learning	2	2	3	Discipline Elective
5	CSA3008	Internship	-	-	8	School Core