


**CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY
(AUTONOMOUS), HYDERABAD-75**

Department of Computer Science and Engineering

Stake Holder Feedback For 2021-22

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Professor and Head Department
Department of Computer Science & Engineering
Chaitanya Bharathi Institute of Technology (A)
Gandipet, Hyderabad-500 075.(T.S.)

HOD, CSE Dept

Stakeholders Feedback Analysis and Action Taken Report-(AY:2021-2022)

1. Students Feedback Analysis

Table 1: Responses related to Student Feedback (No. of Responses: 208)

S. No	Parameters	Avg Rating	%
1	Placement	On Campus	
2	Higher Studies	Not Immediate	
3	Association-	3.74	74.8
4	Internships	1.71	34.2
5	Grievances	No	No
6	Infrastructure-Common->Laboratory facilities	3.75	75
7	Infrastructure-Common->Computing facilities	3.86	77.2
8	Infrastructure-Common->Library facilities	3.82	76.4
9	Infrastructure-Common->Internet and Wi-Fi facilities	2.84	56.8
10	Infrastructure-Common->Games and Sports facilities	3.42	68.4
11	Infrastructure-Common->Admin. and Accounts Section Services	3.60	72
12	Infrastructure-Common->Academics & Examination Cell(AEC)	3.67	73.4
13	Infrastructure-Common->Controller of Examinations(CoE)	3.79	75.8
14	Infrastructure-Common->Transport facilities(if applicable)	3.49	69.8
15	Infrastructure-Common->Canteen facilities	3.39	67.8
16	Infrastructure-Common->Health Center facilities	3.64	72.8
17	Infrastructure-Common->Basic amenities including washrooms	3.30	66
18	Infrastructure-Common->Hostel facilities(if applicable)	3.32	66.4

19	Infrastructure-Common->Overall facilities	3.62	72.4
20	Placement and Training Cell->Training provided for placements.	3.25	65
21	Placement and Training Cell->Training and Placement Office provided on/off campus placement opportunities.	3.88	77.6
22	Placement and Training Cell->Career Counselling & Guidance for higher studies provided.	3.35	67
23	Placement and Training Cell->Co and Extra Curricular opportunities provided.	3.55	71
24	Placement and Training Cell->Motivation towards Research & Development(R&D)	3.46	69.2
25	Curriculum and Syllabus->	3.61	72.2
26	Suggestions-Curriculum Courses on Java, DSA Courses, latest technologies		

Action Taken: Students suggested to add new courses like Full Stack Development and Mobile Application Development. They have been added to the syllabus considering the inputs of the students.

2. Teachers Feedback Analysis

Table 3: Average Response of Faculty from all the departments (No. of Responses: 15)

S. No	Parameters	Avg. Rating	%
1	The design of the curriculum addresses the holistic development of student.	4.47	89.33
2	The curriculum is well balanced with knowledge, skills and employability.	4.67	93.33
3	The syllabus suitable to the course.	4.87	97.33
4	The course/courses are relevant to the present scenario.	4.60	92.00
5	Course objectives and outcomes are well defined.	4.73	94.67

6	Prescribed books/suggested readings and other references appropriate.	4.67	93.33
7	BoS members from Academia and Industry constructive in updating the syllabi according to the changing educational challenges and requirements in line with regulating bodies like AICTE, UGC etc.	4.47	89.33
8	The scheme and evaluation schedules satisfy the Teaching Learning Process.	4.53	90.67
9	Freedom to suggest/propose/modify/incorporate new topics in the syllabus during the revision of curriculum?	4.73	94.67
10	Institute/Department gives the freedom to adopt new technologies/strategies of innovative teaching?	4.60	92.00
11	The environment in the department is conducive to learning, teaching, and research.	4.80	96.00
12	Provisions for professional development are non-discriminatory and fair.	4.87	97.33
13	Adequacy of infrastructure (class/staff rooms, labs, library, and ICT facilities) in the institute.	4.73	94.67

Action Taken: Faculty recommended to include python course in SEM I and include the Deep Learning Applications. Programming for problem solving course for SEM I students is offered with python and Deep Learning Course-Applications are included.

3. Parent Feedback Analysis

Table 4: Responses related to Theory Courses (No. of Responses: 8)

S. No	Parameters	Avg. Rating	%
1	The Teaching-Learning Environment	4.63	92.5
2	Infrastructure Facilities (Laboratories and Class rooms)	4.75	95
3	Library, Internet, Computer, Wi-Fi etc.	4.63	92.5
4	Monitoring of Student's Progress	4.13	82.5
5	Participation by your wards in technical events (workshops and conferences).	4.25	85
6	Participation in personality development activities by your ward.	4.50	90

7	Response and communication with the college authorities.	4.25	85
8	Support Services like Bank and Post office	4.00	80
9	Canteen facility in the campus.	4.63	92.5
10	Student activity centres in the college (clubs and fests)	4.75	95
11	Facility for sports, games and transport facility for the students.	4.63	92.5
12	Training and placement activities in the campus.	4.13	83
13	Quality of Curriculum	4.00	80

Action Taken: Parents recommended to make internship mandatory for R20 Students. Internship has been made mandatory to all the students.

4. Employer Feedback Analysis

Table 5: Responses related to Theory Courses (No. of Responses: 06)

S. No	Parameters	Avg. Rating	%
1	Domain Knowledge and Aptitude Levels	2.50	83.33
2	Problem analysis and design of appropriate solutions	2.33	77.78
3	Attitude towards Research based approach	2.50	83.33
4	Adaptability to new technology/tools and zeal to be a constant learner	2.33	77.78
5	Commitment to work, managerial skills and ability to meet deadlines	2.00	66.67
6	Work towards sustainable development, Societal improvements and Environmental Benefits	2.33	77.78
7	Professional ethics	2.17	72.22
8	Communication Skills	2.50	83.33
9	Team spirit, interpersonal relations and leadership skills	2.17	72.22
10	How do you rate capability to analyze, synthesize, design, develop and test systems/processes	2.17	72.22
11	Overall Job performance	2.17	72.22

Action Taken: Employers recommended to include courses on latest technologies. Courses like Computational Neuroscience, Planning and Estimation of Autonomous systems were introduced.

5. ALUMNI Feedback Analysis

Table 6: Summary of Alumni Feedback Report (No. of Responses: 64)

S. No	Parameters	Avg. Rating	%
1	What is your satisfaction level in associating with CBIT ?	3.94	78.82
2	Laboratory facilities	4.12	82.35
3	Computing facilities	4.41	88.24
4	Library facilities	4.53	90.59
5	Internet and Wi-Fi facilities	3.24	64.71
6	Games and Sports facilities	3.59	71.76
7	Admin. and Accounts Section Services	4.00	80.00
8	Academics & Examination Cell(AEC) Services	4.29	85.88
9	Controller of Examinations(CoE)	4.00	80.00
10	Canteen facilities	4.00	80.00
11	Health Center facilities	3.88	77.65
12	Basic amenities including washrooms	4.00	80.00
13	Overall facilities	3.29	65.88
14	Training provided for placements	3.29	65.88
15	Training and Placement Office provided on/off campus placement opportunities.	4.18	83.53
16	Career Counseling & Guidance for higher studies provided.	3.29	65.88

17	Co and Extra Curricular opportunities provided.	3.53	70.59
18	Motivation towards Research & Development(R&D)	3.47	69.41
19	How do you rate the Curriculum/Syllabus that you have undergone?	3.65	72.94
20	How far the acquired knowledge of mathematics, science and engineering fundamentals helped you in solving complex mechanical engineering problems? (PO1)	3.59	71.76
21	How confident are you in identifying, formulating and analysing complex engineering problems reaching to substantial conclusions by using first principles of mathematics and sciences? (PO2)	3.88	77.65
22	How adequate is the knowledge you gained, helped in providing solutions for complex engineering problems and design/develop systems to meet the societal needs as per standards? (PO3)	4.00	80.00
23	How competent are you in conducting investigations of complex problems using research-based knowledge/methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions?(PO4)	3.88	77.65
24	How acquainted are you in using modern IT tools in modeling of complex engineering problems? (PO5)	4.06	81.18
25	How informed are you with the contextual knowledge of the engineer and society relevant to the professional engineering practice? (PO6)	3.88	77.65
26	How well versed are you in understanding the impact of professional Engineering solutions in the context of environment and sustainable development? (PO7)	3.94	78.82
27	How equipped are you with the ethical principles and responsibilities in accordance with the Engineering practices? (PO8)	4.12	82.35
28	How managerial are you in effective functioning with the team?(PO9)	4.00	80.00
29	How effective are you in communicating for comprehension, documentation and presentation of engineering activities? (PO10)	4.00	80.00
30	How entrepreneurial are you in identifying, acquiring and allocating	3.82	76.47

	the finance and other resources for an effective project management? (PO11)		
31	How adaptable are you to engage in life long learning approaches in the of context of technological changes?(PO12)	3.88	77.65
32	How far the programme enabled you demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments(PSO1)	3.71	74.12
33	How far you are able to recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.?(PSO2)	3.65	72.94
Average Response			


Action Taken: Alumni recommended to introduce labs for new technologies. Labs for new technologies like Planning and Estimation of Autonomous systems has been added in syllabus.

Chaitanya Bharathi Institute of Technology (Autonomous)
Gandipet, Hyderabad 500075
Department of Computer Science and Engineering

**Consolidated Action taken report on the Feedback obtained from Stake Holders AY
: 2021-2022**

S.No	Suggestions from	Suggestions	Action Taken	Remarks
1	Student	Syllabus need to be updated according to the latest trend in the industry	Full Stack Development and Mobile Application Development courses syllabus updated with latest concepts which are offered for students from the academic year 20222023	BOS 2022, Full Stack Development, Mobile Application Development
2	Student	Electives on latest technologies to be included	Electives on latest technologies like Computational neuro science and Multi agent intelligent systems are offered from the academic year 20222023.	BOS 2022, Computational Neuroscience, Multi agent intelligent systems
3	Student	Include hands on practical's for latest technologies	Hands on Lab session on DevOps is offered from the AY 2022-2023	DevOps
4	Alumnus	Add new technologies to curriculum Better introduce Labs for electives	New courses on important and latest technologies like Planning and Estimation of Autonomous Systems and High Performance Computing are offered from AY 2022-2023	Planning and Estimation of Autonomous Systems

5	Alumnus	More emphasis on Data Structures and Algorithms and industry interaction and following the curriculum which is in trend.	Basics of Data Structure course is offered for non CSE students to strengthen them for placements	BOS 2021
6	Faculty	Python course need to be included in the I Sem .	Programming for problem solving course syllabus is revised from the AY 2022-2023 offering with python concepts	BOS 2022
7	Faculty	Deep Learning Applications to be included	Deep Learning Course – applications are included	Deep Learning
8	Employer	Better exposure on latest technologies in the market	Courses on Latest Technologies are offered in AY 2022-2023	Computational Neuroscience, Planning and Estimation of Autonomous Systems
9	Parent	Internship to be offered by the companies in the campus	Internships are made mandatory for the students from R20 regulations.	Internship


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HOD, CSE Dept.



Department of Computer Science and Engineering

MINUTES of BoS (CSE)-MEETING

Department of CSE BoS meeting (online) for the program B.E. CSE was conducted on 04-06-2022 at 10:00 AM

Agenda

1. Confirmation of the minutes of the BoS (CSE) meeting held on 19.04.2021
2. Approval for BE (CSE) – V to VIII semester Syllabus
3. Revision of PPS and OOPS syllabus in I and II Semesters
4. Introduction of new Courses for M.Tech (CSE)
5. Introduction of Additional Minor Engineering Program
6. Approval of BE -AIML scheme and syllabus of III and IV Semesters
7. Any other item

The following members were present:

Sno	Name	Organization	Designation
1	Prof. P. Ravinder Reddy	Principal, CBIT(A)	Principal
2	Prof. Y. Ramadevi	Head, CSE Dept., CBIT	Chairperson
3	P. Radha Krishna	Head & Professor, Dept. of CSE, NITW.	Expert from University
4	Prof. Praveen Tammana	Assistant Professor, Dept. of CSE, IIT Hyderabad	Academic Expert
5	Dr. Nagender Kumar S	Associate Professor, SCIS, University of Hyderabad Central University	Academic Expert
6	Mr. Srikanth Srinivasan	Sr. Director & Head - Membership & Outreach	Member, Corporate
7	Mr. Akash Sinha	Head, Learning and Development, L4G, Hyderabad	Member from Industry
8	Mr. M. Nagarjuna Reddy	Team Manager, SAP Labs India Pvt. Ltd. (PG Alumni)	Member from Industry
9	Prof. M. Swamy Das	Professor, CSE Dept.	Member
10	Prof. K. Sagar	Professor, CSE Dept.	Member
11	Prof. China Ramu	Professor, CSE Dept.	Member
12	Prof. N. Ramadevi	Professor, CSE Dept.	Member
13	Dr. R. Ravinder Reddy	Associate Professor, CSE Dept.	Member
14	Dr. E. Padmalatha	Assistant Professor, CSE Dept.	Member
15	Dr. Sangeeta Gupta	Associate Professor, CSE Dept.	Member
16	Smt. A. Sangeetha	Assistant Professor, CSE Dept.	Member
17	Smt.K.Mary Sudha Rani	Assistant Professor, CSE Dept.	Member
18	Smt. T. Suvarna Kumari	Assistant Professor, CSE Dept.	Member
19	Smt. P. V. Manohara Ruth	Assistant Professor, CSE Dept.	Member
20	Dr. Kolla Morarjee	Associate Professor, CSE Dept.	Invitee
21	Smt. I Srujana	Assistant Professor, CSE Dept.	Invitee

22	Smt. S. Durga Devi	Assistant Professor, CSE Dept.	Invitee
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The Chairperson welcomed BoS members and briefed about the Institute Vision, Mission and Department Vision and Mission, New Program BE –AIML sanction from AY -2021-22 and NBA Accreditation.

1. Confirmation of minutes of meeting (online) held on 19.04.2021

Minutes of BOS meeting held on 19.04.2021 were confirmed.

2. Approval of R20 BE(CSE) Syllabus for V to VIII Semester

Prof. K Sagar presented Plan of Study for BE CSE and common Professional Electives Courses for all three programs. The same were approved with minor modifications.

The Members have made the following Suggestions/Recommendations/Observations.

- a. In MAD course, Flutter and IOS to be included.
- b. In Full stack Development, REST API, Angular JS to replace by React JS , GO language may be included(optional)
- c. Relevant Case Studies/ Usecases / Scenarios are to be included in Theory/ Practical's wherever possible.
- d. New textbooks and new editions may to be included for all the courses.

All the Suggestions/ Recommendations were incorporated while framing the syllabus.

3. Revision of PPS and OOPS syllabus in I and II Semesters

- a. The revised syllabus of the common course Programming and Problem Solving (22CSC01 & 22CSC02) is presented and the same was approved w.e.f ACY 2022-23
- b. The revised syllabus of the course Object Oriented Programming (22CSC03 & 22CSC04) syllabus) is presented and the same was approved w.e.f ACY 2022-23 offered to BE –CSE, CSE-(AI &ML), CSE(IoT), BE-AI&ML, BE-IT, BE-AIDS

4. Introduction of new Courses from Emerging areas for M. Tech (CSE)

List of New courses were approved for inclusion in R20 M. Tech (CSE)

- | | |
|--|-------------------------------------|
| 1) Research Methodologies in CSE and IPR | 8) Soft Computing(core to elective) |
| 2) Advanced Networks | 9) Video Analytics |
| 3) Advanced Networks Lab | 10) Cyber Security |
| 4) Advanced Database | 11) Cloud Computing Lab |
| 5) High Performance computing | 12) Soft Computing Lab |
| 6) Advanced Deep Learning | 13) Full Stack Development |
| 7) Cloud Computing | 14) Natural Language Processing |
| | 15) Robotics |

5. Revision of Additional Minor Engineering Programmes and introduction of new Minor Engineering Programme in Advanced Web Development (AICTE-LITE)

- a. The proposed Scheme and syllabus of additional minor engineering in Computer Engineering, AI &ML, Cyber Security and Internet of Things are approved.

- b. The proposed scheme and syllabus of AICTE-LITE Minor Degree in Advanced Web Development was approved.

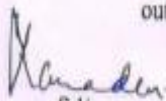
6. Approval of BE –AI&ML scheme and syllabus of III and IV Semesters

Prof. M Swamy Das presented the plan of study and syllabus of III and IV semesters for BE-Artificial Intelligence and Machine Learning

- a. Students admitted in 2021-22 will study BEE Theory only in III Semester and Robotics and Drones in IV semester.
- b. Students admitted in AY 2022-23 will study BEE Theory in I Semester and Robotics and Drones in II semester.
- c. Students admitted from AY 2022-23 will study Cognitive and neuroscience in place of BEE (III semester). Similarly they will study Simulation and Modeling in Place of Robotics and Drones (IV semester).
- d. The syllabus of V unit of Data Base Systems may be reviewed. However, the syllabus was adapted from AICTE model curriculum
- e. The title of Building Large, Reliable Software Systems is to be replaced. It is proposed to Principles of Software Construction.

7. Any other item

- a. PSOs for BE–CSE, BE-CSE (AI & ML), BE-CSE (IoT, CS& BCT), BE-AI & ML were revised and approved.
- b. For Awarding honors degree in Computer science and Engineering students shall earn 20 credits from Professional Electives (not studied in regular program)/ emerging areas.
- c. The proposed Open Elective courses offered to other departments are approved
- d. Members from Industry expressed their willingness to extend their cooperation and coordination for providing Internship opportunities, Placements Assistance and Career Guidance for the benefit of the students.
- e. They expressed to extend their support in organizing Faculty Development Programs, Workshops Conferences on Latest emerging Technologies, to carry out Research Activities and Consultancy.


Sd/-

Chairperson, BoS

20CSE17

**ENTERPRISE APPLICATION DEVELOPMENT LAB
(Professional Elective – II)**

Instruction	2 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	50 Marks
Continuous Internal Evaluation	50 Marks
Credits	1

Pre-requisites: Internet and web technologies, OOPs, Database management systems.

Course Objectives: The objectives of this course are,

1. To acquire knowledge on MongoDB, ReactJS, Express, Node.js and Angular2 to develop web applications.
2. Ability to develop dynamic web content using web frameworks.
3. To understand the design and development process of a complete web application.

Course Outcomes: On successful completion of the course, students will be able to,

1. Prepare database connections with application servers.
2. Design user interfaces using ReactJS.
3. Construct strong expertise on Express framework to develop responsive web applications.
4. Create server side applications using Node.js
5. Develop SPA using Angular 2.
6. Invent next culture-shifting web applications.

List of Programs:

1. Installation, configuration and connection establishment of MongoDB.
2. CRUD operations on MongoDB.
3. Building and Deploying React App.
4. Demonstration of component intercommunication using ReactJS
5. Create Express application,
6. Demonstration of authentication and authorization using Express.
7. Data access using Node.js
8. Create a form to edit the data using Angular2
9. A case study on a single platform for all financial data for NSE India.

Textbook:

1. Amos Q. Haviv, MEAN Web Development, Second Edition, Packt Publications, November 2016
2. Vasan Subramanian, "Pro MERN Stack, Full Stack Web App Development with Mongo, Express, React, and Node", 2nd Edition, APress.

Suggested Reading:

1. Shelly Powers, "Learning Node: Moving to the Server-Side", 2nd Edition, O'REILLY, 2016.
2. Simon D. Holmes and Clive Harber, "Getting MEAN with Mongo, Express, Angular, and Node", Second Edition, Manning Publications, 2019.
3. Brad Dayley, "Node.js, MongoDB and Angular Web Development", 2nd Edition, Addison-Wesley Professional, 2017.

Online Resources:

1. <https://www.mongodbtutorial.org/mongodb-crud/>
2. <https://reactjs.org/tutorial/tutorial.html>
3. <https://www.javatpoint.com/expressjs-tutorial>
4. <https://www.javatpoint.com/nodejs-tutorial>
5. <https://angular-training-guide.rangle.io/>

20CSE23

**MOBILE APPLICATION DEVELOPMENT
(Professional Elective – IV)**

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	60 Marks
Continuous Internal Evaluation	40 Marks
Credits	3

Pre-requisites: Programming for Problem solving, OOPs.

Course Objectives: The objectives of this course are,

1. To demonstrate their understanding of the fundamentals of Android operating systems.
2. To demonstrate their skills in using Android software development tools.
3. To demonstrate their ability to develop software with reasonable complexity on mobile platform.

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

1. Interpret and analyze Android platform architecture and features to learn best practices in android programming.
2. Design the User Interface for mobile applications.
3. Apply Intents, Broadcast receivers and Internet services in Android App.
4. Develop database management system to retrieve and/or store data for mobile application.
5. Evaluate and select appropriate android solutions to the mobile computing platform.
6. Build Flutter applications for complex problems.

UNIT - I

Introduction to Android Operating System: Android SDK Features, Developing for Android, Best practices in Android programming, Android Development Tools. Android application components – Android Manifest file, Externalizing resources, The Android Application Lifecycle, A Closer Look at Android Activities.

UNIT - II

Android User Interface: Introducing Layouts, User Interface (UI) Components – Editable and Non Editable Text Views, Buttons, Radio and Toggle Buttons, Checkboxes, Spinners, Dialog and pickers. Event Handling – Handling clicks or changes of various UI components. Introducing Fragments, Multi-screen Activities.

UNIT - III

Intents and Broadcasts: Introducing Intents: Using Intents to Launch Activities. Using Intent to dial a number or to send SMS. **Broadcast Receivers** –Creating Intent Filters and Broadcast Receivers: Using Intent Filters to Service Implicit Intents. Finding and using Intents received within an Activity. Customizing the Action Bar, Using the Action Bar for application navigation, Notifications – Creating and Displaying notifications, Displaying Toasts.

UNIT - IV

Persistent Storage: Files – Reading data from files, listing contents of a directory, Creating and Saving Shared Preferences, Retrieving Shared Preferences. Database –Introducing Android Databases, Introducing SQLite, Content Values and Cursors, Working with SQLite Databases. Registering Content Providers, Using content Providers (insert, delete, retrieve and update).

UNIT - V

Advanced Topics: Alarms –Using Alarms. Using Internet Resources – Connecting to internet resource, using download manager. Location Based Services –Using Location-Based Services, Using the Emulator with Location-Based Services. Introduction to Flutter, Dart introduction, Data Types and Variables, String interpolation, Operators, Control Flow Statements, Functions, Classes, Read and write with Dart IO: Setup, Read and write with Dart IO: Final code.

Text Books:

1. Reto Meier, "Professional Android 4 Application Development", Wiley India, (Wrox), 2012.
2. O'Reilly Dawn Griffiths, David Griffiths "Head First Android Development", O'Reilly Media, Inc., 2015.

3. Dieter Meiller, "Modern App Development with Dart and Flutter 2", Walter de Gruyter GmbH, Berlin/Boston, 2021.

Suggested Reading:

1. Wei-Meng Lee, "Beginning Android 4 Application Development", Wiley India (Wrox), 2013.
2. David Wolber, Hal Abelson, Ellen Spertus & Liz Looney, "App Inventor-Create your own Android Apps", O'Reilly, 2011.

Online Resources:

1. https://developer.android.com/studio?gclid=Cj0KCQjwyN-DBhCDARIsAFOELTkESs57QOqIUktCOBZKgk8NkVT5OhpCnxUx4V6yDMPt6c-Ot7j4-sEaAiasEALw_wcB&gclidsrc=aw.ds
2. https://onlinecourses.nptel.ac.in/noc20_cs52/preview
3. https://onlinecourses.swayam2.ac.in/nou21_ge41/preview



Department of Computer Science and Engineering

MINUTES of BoS (CSE)-MEETING

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3. Revision of PPS and OOPS syllabus in I and II Semesters
4. Introduction of new Courses for M.Tech (CSE)
5. Introduction of Additional Minor Engineering Program
6. Approval of BE -AIML scheme and syllabus of III and IV Semesters
7. Any other item

The following members were present:

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2	Prof. Y. Ramadevi	Head, CSE Dept., CBIT	Chairperson
3	P. Radha Krishna	Head & Professor, Dept. of CSE, NITW.	Expert from University
4	Prof. Praveen Tammana	Assistant Professor, Dept. of CSE, IIT Hyderabad	Academic Expert
5	Dr. Nagender Kumar S	Associate Professor, SCIS, University of Hyderabad Central University	Academic Expert
6	Mr. Srikanth Srinivasan	Sr. Director & Head - Membership & Outreach	Member, Corporate
7	Mr. Akash Sinha	Head, Learning and Development, L4G, Hyderabad	Member from Industry
8	Mr. M. Nagarjuna Reddy	Team Manager, SAP Labs India Pvt. Ltd. (PG Alumni)	Member from Industry
9	Prof. M. Swamy Das	Professor, CSE Dept.	Member
10	Prof. K. Sagar	Professor, CSE Dept.	Member
11	Prof. China Ramu	Professor, CSE Dept.	Member
12	Prof. N. Ramadevi	Professor, CSE Dept.	Member
13	Dr. R. Ravinder Reddy	Associate Professor, CSE Dept.	Member
14	Dr. E. Padmalatha	Assistant Professor, CSE Dept.	Member
15	Dr. Sangeeta Gupta	Associate Professor, CSE Dept.	Member
16	Smt. A. Sangeetha	Assistant Professor, CSE Dept.	Member
17	Smt.K.Mary Sudha Rani	Assistant Professor, CSE Dept.	Member
18	Smt. T. Suvarna Kumari	Assistant Professor, CSE Dept.	Member
19	Smt. P. V. Manohara Ruth	Assistant Professor, CSE Dept.	Member
20	Dr. Kolla Morarjee	Associate Professor, CSE Dept.	Invitee
21	Smt. I Srujana	Assistant Professor, CSE Dept.	Invitee

22	Smt. S. Durga Devi	Assistant Professor, CSE Dept.	Invitee
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The Chairperson welcomed BoS members and briefed about the Institute Vision, Mission and Department Vision and Mission, New Program BE –AIML sanction from AY -2021-22 and NBA Accreditation.

1. Confirmation of minutes of meeting (online) held on 19.04.2021

Minutes of BOS meeting held on 19.04.2021 were confirmed.

2. Approval of R20 BE(CSE) Syllabus for V to VIII Semester

Prof. K Sagar presented Plan of Study for BE CSE and common Professional Electives Courses for all three programs. The same were approved with minor modifications.

The Members have made the following Suggestions/Recommendations/Observations.

- a. In MAD course, Flutter and IOS to be included.
- b. In Full stack Development, REST API, Angular JS to replace by React JS , GO language may be included(optional)
- c. Relevant Case Studies/ Usecases / Scenarios are to be included in Theory/ Practical's wherever possible.
- d. New textbooks and new editions may to be included for all the courses.

All the Suggestions/ Recommendations were incorporated while framing the syllabus.

3. Revision of PPS and OOPS syllabus in I and II Semesters

- a. The revised syllabus of the common course Programming and Problem Solving (22CSC01 & 22CSC02) is presented and the same was approved w.e.f ACY 2022-23
- b. The revised syllabus of the course Object Oriented Programming (22CSC03 & 22CSC04) syllabus) is presented and the same was approved w.e.f ACY 2022-23 offered to BE –CSE, CSE-(AI &ML), CSE(IoT), BE-AI&ML, BE-IT, BE-AIDS

4. Introduction of new Courses from Emerging areas for M. Tech (CSE)

List of New courses were approved for inclusion in R20 M. Tech (CSE)

- | | |
|--|-------------------------------------|
| 1) Research Methodologies in CSE and IPR | 8) Soft Computing(core to elective) |
| 2) Advanced Networks | 9) Video Analytics |
| 3) Advanced Networks Lab | 10) Cyber Security |
| 4) Advanced Database | 11) Cloud Computing Lab |
| 5) High Performance computing | 12) Soft Computing Lab |
| 6) Advanced Deep Learning | 13) Full Stack Development |
| 7) Cloud Computing | 14) Natural Language Processing |
| | 15) Robotics |

5. Revision of Additional Minor Engineering Programmes and introduction of new Minor Engineering Programme in Advanced Web Development (AICTE-LITE)

- a. The proposed Scheme and syllabus of additional minor engineering in Computer Engineering, AI &ML, Cyber Security and Internet of Things are approved.

- b. The proposed scheme and syllabus of AICTE-LITE Minor Degree in Advanced Web Development was approved.


6. Approval of BE –AI&ML scheme and syllabus of III and IV Semesters

Prof. M Swamy Das presented the plan of study and syllabus of III and IV semesters for BE-Artificial Intelligence and Machine Learning

- a. Students admitted in 2021-22 will study BEE Theory only in III Semester and Robotics and Drones in IV semester.
- b. Students admitted in AY 2022-23 will study BEE Theory in I Semester and Robotics and Drones in II semester.
- c. Students admitted from AY 2022-23 will study Cognitive and neuroscience in place of BEE (III semester). Similarly they will study Simulation and Modeling in Place of Robotics and Drones (IV semester).
- d. The syllabus of V unit of Data Base Systems may be reviewed. However, the syllabus was adapted from AICTE model curriculum
- e. The title of Building Large, Reliable Software Systems is to be replaced. It is proposed to Principles of Software Construction.

7. Any other item

- a. PSOs for BE–CSE, BE-CSE (AI & ML), BE-CSE (IoT, CS& BCT), BE-AI & ML were revised and approved.
- b. For Awarding honors degree in Computer science and Engineering students shall earn 20 credits from Professional Electives (not studied in regular program)/ emerging areas.
- c. The proposed Open Elective courses offered to other departments are approved
- d. Members from Industry expressed their willingness to extend their cooperation and coordination for providing Internship opportunities, Placements Assistance and Career Guidance for the benefit of the students.
- e. They expressed to extend their support in organizing Faculty Development Programs, Workshops Conferences on Latest emerging Technologies, to carry out Research Activities and Consultancy.


Sd/-
Chairperson, BoS

20CAE10

COMPUTATIONAL NEUROSCIENCE
(Professional Elective – V)

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	60 Marks
Continuous Internal Evaluation	40 Marks
Credits	3

Pre-requisites: Artificial Intelligence, Machine Learning.

Course Objectives: The objectives of this course are,

1. To learn computational neuroscience models and their applications.
2. To explore the computational principles governing various aspects of vision, sensory-motor control, learning, and memory.
3. To learn representation of information by spiking neurons, processing of information in neural networks, and algorithms for adaptation and learning.

Course Outcomes: On successful completion of the course, students will be able to,

1. Understand the fundamentals of computational neuroscience.
2. Analyse the Neural Encoding Models.
3. Make use of Neurons & Neural coding to extract information.
4. Analyse the Computing in Carbon and Computing with Networks.
5. Analyse the various learning methodologies.
6. Evaluate the Performance of different neurological models.

UNIT - I

Introduction: Introduction & Basic Neurobiology Computational Neuroscience: Descriptive Models, Computational Neuroscience: Mechanistic and Interpretive Models, the Electrical Personality of Neurons, Making Connections: Synapses, Time to Network: Brain Areas and their Function.

UNIT - II

Neural Encoding Models: Neural Encoding, Simple Models, Feature Selection, Variability, Vectors and Functions, Convolutions and Linear Systems, Change of Basis and PCA.

UNIT - III

Extracting Information from Neurons & Neural coding: Neural Decoding and Signal Detection Theory, Population Coding and Bayesian Estimation, Reading Minds: Stimulus Reconstruction, Information and Entropy, Calculating Information in Spike Trains, Coding Principles.

UNIT - IV

Computing in Carbon and Computing with Networks: Modelling Neurons, Spikes, Simplified Model Neurons, A Forest of Dendrites, modelling Connections Between Neurons, Introduction to Network Models, The Fascinating World of Recurrent Networks.

UNIT - V

Plasticity in the Brain & Learning: Synaptic Plasticity, Hebb's Rule, and Statistical Learning, Introduction to Unsupervised Learning, Sparse Coding and Predictive Coding.

Learning from Supervision and Rewards: Neurons as Classifiers and Supervised Learning, Reinforcement Learning: Predicting Rewards, Reinforcement Learning: Time for Action.

Text Books:

1. Fundamentals of Computational Neuroscience, Thomas Trappenberg, OUP Oxford; 2nd edition, 2009.
2. An Introductory Course in Computational Neuroscience, Paul Miller, The MIT Press; 1st edition, 2018
3. Paul Miller, "An Introductory Course in Computational Neuroscience", The MIT Press, 2018

Suggested Reading:

1. Britt-Anne Anderson, "Computational Neuroscience and Cognitive Modelling: A Student's Introduction to Methods and Procedures", SAGE Publications Ltd, 2014.
2. Ranu Jung, Dieter Jaeger, "Encyclopedia of Computational Neuroscience", Springer, 2015.

3. Trappenberg, Thomas, "Fundamentals of computational neuroscience", OUP Oxford, 2009.
4. Arbib, Michael A., and James J. Bonaiuto, eds, "From neuron to cognition via computational neuroscience", MIT Press, 2016.

Online Resources:

1. <https://nptel.ac.in/courses/102106023>
2. https://onlinecourses.nptel.ac.in/noc22_ee66
3. <https://www.coursera.org/learn/computational-neuroscience#syllabus>
4. <https://www.edx.org/course/computational-neuroscience-neuronal-dynamics-of-co>

20CAE05

MULTI AGENT INTELLIGENT SYSTEMS
(Professional Elective – VI)

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	60 Marks
Continuous Internal Evaluation	40 Marks
Credits	3

Pre-requisites: Linear Algebra and Calculus, Artificial Intelligence.

Course Objectives: The objectives of this course are,

1. To learn various types of multi agent systems and their applications.
2. To acquire the knowledge of various multi agent system architectures and their learning methods.
3. To understand multi agent decision making systems and their applications.

Course Outcomes: On Successful completion of this course, student will be able to,

1. Understand various aspects of multi agent systems and architecture of intelligent agents.
2. Understand of various types of reasoning Agents.
3. Acquire knowledge of multi agent systems communication and cooperation methods.
4. Classify various types of decision making processes for multi agent systems.
5. Use appropriate framework for agent communication and information sharing processes.
6. Explore different kinds of Auctions for multi agent environment and applications.

UNIT - I

Introduction: The Vision Thing, Some Views of the Field, Agents as a paradigm for software engineering, Agents as a tool for understanding human societies

Intelligent Autonomous Agents: Intelligent Agents, agent and objects, agents and expert systems, agents as intentional systems, Abstract Architectures for Intelligent Agents.

UNIT - II

Deductive Reasoning agents: Agents as theorem Provers, Agent-Oriented programming.

Practical Reasoning Agents: Practical Reasoning equals Deliberation plus Means-Ends Reasoning, Means-Ends Reasoning, HOMER, The Procedural reasoning System.

Reactive and Hybrid Agents: Reactive Agents -The subsumption architecture, PENGI, Limitations of reactive agents. Hybrid agents -Touring Machines.

UNIT - III

Understanding Each Other: Ontology Fundamentals, Ontology Languages, RDF.

Communicating: Speech Acts – Austin, Searle, Speech acts as rational action, Agent Communication Languages -KQML.

Working Together: Cooperative Distributed Problem Solving, Task sharing and Result sharing-Task sharing in the Contract Net. Result Sharing, Combining Task and Result Sharing, Handling Inconsistency, coordination.

UNIT - IV

Multi agent Decision Making - Multi Agent Interactions: Utilities and Preferences, Setting the Scene, The Prisoner's Dilemma.

Making Group Decisions: Social welfare Functions and Social Choice Functions, Voting Procedures- Plurality, Sequential majority elections.

Forming Coalitions: cooperative Games

UNIT - V

Allocating Scarce Resources: Classifying Auctions, Auctions for Single items - English auctions, Dutch auctions. Combinatorial auctions - Bidding Languages. Auctions in Practice-Online auctions, Adwords auctions

Applications: Agents for Workflow and Business Process Management, Agents for Distributed Sensing, Agents for Information Retrieval and Management, Agents for Electronic Commerce, Agents for Human - Computer Interfaces, Agents for Virtual Environments, Agents for Social Simulation, Agents for X.

Text Books:

1. Michae L. Wooldridg E, "An Introduction to Multi Agent Systems", Wiley publications, 2nd Edition, 2009.

Suggested Reading:

1. Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach", 4th Global edition, 2021.
2. Gerhard Weiss, "Multiagent Systems", Second Edition, 2016.

Online Resources:

1. <https://www.coursera.org/lecture/modeling-simulation-natural-processes/multi-agent-systems-kAKyC>

20CSE10

DEVOPS
(Professional Elective – II)

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	60 Marks
Continuous Internal Evaluation	40 Marks
Credits	3

Pre-requisites: Database management systems, Operating systems, OOPs.

Course Objectives: The objectives of this course are,

1. To describe the agile relationship between development and IT operations.
2. To understand the skill sets and high-functioning teams involved in DevOps and related methods to reach a continuous delivery capability.
3. To implement automated system update and DevOps lifecycle.

Course Outcomes: On successful completion of this course, students will be able to,

1. Identify components of Devops environment.
2. Describe Software development models and architectures of DevOps.
3. Apply different project management, integration, testing and code deployment tools.
4. Investigate different DevOps Software development models.
5. Assess various Devops practices.
6. Collaborate and adopt Devops in real-time projects.

UNIT - I

Introduction: Software development models, Introduction to DevOps, Why DevOps, DevOps process and Continuous Delivery, Delivery pipeline, Release management, Scrum, Kanban DevOps Architecture, DevOps Workflow DevOps Lifecycle for Business Agility, and Continuous Testing.

UNIT - II

Introduction to project management: The need for source code control, the history of source code management, Git - **A version control tool**, Version Control System and Types, CVCS and DVCS.

Git Essentials: Creating repository, Cloning, check-in and committing, Fetch pull and remote, Branching.

UNIT - III

Jenkins - Continuous integration: Introduction to Continuous Integration, Build & Release and relation with DevOps Why continuous integration, Nodes/Slaves, Managing plugins, Managing Software Versions.

Build Tools: Overview of Maven, Virtualization, and Virtualization in DevOps Understand Containers Docker - A containerization technology.

UNIT - IV

Testing Tools and automation: Testing Tools and automation: Various types of testing, Automation of testing Pros and cons, Selenium -Introduction, Selenium features, Testing backend integration points, Test-driven development, REPL-driven development.

Deployment Tools: Deployment systems, Virtualization stacks, code execution at the client, Puppet master and agents, Ansible, Deployment tools: Chef, SaltStack.

UNIT - V

Code monitoring and Issue Tracking: Code monitoring tools Nagios, Munin, Ganglia, Log handling.

Introduction to issue trackers, Need of issue tracker: Workflows and issues.

Trackers tools: Bugzilla, GitLab tracker, and Jira.

Text Books:

1. Joakim Verona, "Practical Devops", Second Edition. Ingram short title; 2nd edition, 2018.
2. Deepak Gaikwad, Viral Thakkar, "DevOps Tools from Practitioner's Viewpoint". Wiley publications, 2019.

Suggested Reading:

1. Len Bass, Ingo Weber, Liming Zhu, "DevOps: A Software Architect's Perspective". Addison Wesley, 1st Edition, 2015.

Online Resources:

1. <https://www.coursera.org/learn/intro-to-devops>
2. <https://www.tutorialspoint.com/introduction-to-devops/index.asp>

20CAE09**PLANNING AND ESTIMATION OF AUTONOMOUS SYSTEMS
(Professional Elective – IV)**

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	60 Marks
Continuous Internal Evaluation	40 Marks
Credits	3

Pre-requisites: Linear algebra and calculus, Design and Analysis of Algorithms, Artificial Intelligence, Machine Learning, Deep Learning.

Course Objectives: The objectives of this course are,

1. To cover the basics of decision-making under partially known or uncertain environments.
2. To introduce decision theory and reinforcement learning.

Course Outcomes: On successful completion of the course, students will be able to,

1. Identify different motion planning schemas under different environments.
2. Define different states and have mathematical knowledge on drop-off and estimation algorithms.
3. Analyze different planning and decision techniques.
4. Appraise different methods to solve finite Markov decision problem.
5. Distinguish different decision making techniques under uncertain environment.
6. Apply different information gathering techniques and associate Human-robot interaction.

UNIT - I

Introduction, Autonomous Robots, Robot Arm Manipulators, Mobile Robots, Multi-Robot Systems and Swarms, Perception, Planning, Control, and Coordination for Autonomous Vehicles, Motion-Planning Schemes: Known Configuration Spaces: Potential-Field Algorithms, Grid-Based Algorithms, Sampling-Based Algorithms; Motion-Planning Schemes: Partially Known Configuration Spaces: BUG0, BUG1, and BUG2.

UNIT - II

State Estimation: Least Square Estimation (Linear, Weighted, Non-linear); Probability Basics; RANSAC for Outlier Rejection; State Estimation Problem; Bayes Filter; Gaussian Filters; Kalman Filter; Extended Kalman Filter; Unscented Kalman Filter; Information Filter.

UNIT - III

Planning: STRIPS-planning; Planning domain description language (PDDL); Graph search - A* ; Markov Decision process-Uncertainty in Action Selection, Value Iteration, Finite Environments, POMDPs ; Dynamic Programming, Monte Carlo Approximation, Temporal difference learning.

UNIT - IV

Decision making under Uncertainty: Introduction to Reinforcement learning, Imitation Learning, Bayesian reinforcement learning- Acting on Unknown MDPs, Bayesian method in Continuous spaces, solving POMDPs; Bandit Problem-Introduction; Finite Stochastic Bandit problem; Reinforcement learning in MDPs.

UNIT - V

Information Gathering and Exploration: Gaussian Processes and exploration algorithms; Human-robot interaction: Introduction, Design in HRI, Design methods, Spatial Interaction, Verbal and nonverbal Interactions; Research methods in HCI.

Text Books:

1. Eugene Kagan, Nir Shvalb, Irad Ben-Gal, "Autonomous Mobile Robots and Multi-Robot Systems: Motion-Planning, Communication, and Swarming", Wiley, 2019
2. Pendleton S.D., Andersen H., Du X., Shen X., Meghjani M., Eng Y. H., Rus D., Ang M.H. "Perception, Planning, Control, and Coordination for Autonomous Vehicles. Machines" 2017.
<https://doi.org/10.3390/machines5010006>

Suggested Reading:

1. Sebastian Thrun, Wolfram Burgard, Dieter Fox, "Probabilistic robotics", MIT Press, 2005.
2. Richard S. Sutton, Andrew G. Barto, "Reinforcement Learning: An Introduction", 2018, MIT Press.

3. Christos Dimitrakakis, Ronald Ortner, "Decision Making Under Uncertainty and Reinforcement Learning", 2021.
4. Bartneck, C., Belpaeme, T., Eyssele, F., Kanda, T., Keijsers, M., & Sabanovic, S, "Human-Robot Interaction – An Introduction", Cambridge University Press, 2020.
5. Todd Litman, "Autonomous Vehicle Implementation Predictions: Implications for Transport Planning", Victoria Transport Policy Institute, 2022.
6. Mykel J. Kochenderfer, "Decision Making Under Uncertainty: Theory and Application", MIT Press, 2015.
7. Wen Yu, Adolfo Perrusquia, "Human-Robot Interaction Control Using Reinforcement Learning", Wiley, 2021.
8. Vincent A. W. J. Marchau, Warren E. Walker, Pieter J. T. M. Bloemen, Steven W. Popper , "Decision Making under Deep Uncertainty: From Theory to Practice", Springer, 2019.
9. Victor Becerra, "Autonomous Control of Unmanned Aerial Vehicles", MDPI, 2019.

Online Resources:

1. Autonomous Systems, <https://www.udacity.com/school-of-autonomous-systems>



Department of Computer Science and Engineering

MINUTES OF BOS-MEETING

CSE Department BOS (online) meeting was conducted on 19-04-2021 at 10:30 AM

Agenda

1. Introduction of BOS members
2. Confirmation of minutes of meeting (online) held on 25-07-2020 at 2.00 PM.
3. Approval of R20 UG Syllabus for III and IV semester
4. Scheme of R20 for UG V Semester to VIII Semester
5. Approval of R20 PG scheme and Syllabus of I,II,III,IV Semester
6. Any other item

The following members were present:

Sno	Name	Organization	Designation
1	Dr. G. P. S. Varma	Principal, CBIT	
2	Dr. Y Ramadevi	Head, CSE Dept., CBIT	Chairperson
3	Dr. K Shyamala	Head, CSE Dept., OUCE	Nominee from OU
4	Dr. Praveen Tammana	Assistant Professor, Dept. of CSE, IIT Hyderabad	Academic Expert
5	Dr. Nagender Kumar S	Associate Professor, SCIS, University of Hyderabad Central University	Academic Expert
6	Mr. Srikanth Srinivasan	Sr. Director & Head - Membership & Outreach	Member, Corporate
7	Mr. Vinod Kumar	CEO, Kernelsphere Technologies Pvt. Ltd . Konnect Solutions Pvt. Ltd	Member from Industry
8	Mr. Akash Sinha	Head, Learning and Development, L4G, Hyderabad	Member from Industry
9	Mr. M. Nagarjuna Reddy	Team Manager, SAP Labs India Pvt. Ltd. (PG Alumni)	Member from Industry
10	Prof. M Swamy Das	Professor, CSE Dept.	Member
11	Dr. K Sagar	Professor, CSE Dept.	Member
12	Prof. N Ramadevi	Professor, CSE Dept.	Member
13	Dr. R. Ravinder Reddy	Associate Professor, CSE Dept.	Member
14	Dr. E. Padmalatha	Assistant Professor, CSE Dept.	Member
15	Dr. T. Sridevi	Associate Professor, CSE Dept.	Member
16	Dr. Sangeeta Gupta	Associate Professor, CSE Dept.	Member
17	Smt. A. Sangeetha	Assistant Professor, CSE Dept.	Member
18	Smt. T. Suvama Kumari	Assistant Professor, CSE Dept.	Member
19	Smt. P Vimala Manohara Ruth	Assistant Professor, CSE Dept.	Member
20	Smt. S. Durga Devi	Assistant Professor, CSE Dept.	Invitee

- The Chairperson welcomed the new BoS members and briefed about the Institute Vision, Mission and Department Vision and Mission.
- Department PEOs, PO, PSO were presented

The Committee has resolved for following modifications

1. Introduction of BOS members

Chairperson introduced Members of the BoS and welcomed all for the Meeting.

2. Confirmation of minutes of meeting (online) held on 25-07-2020 at 2.00 PM.

Minutes of BOS meeting held on **25-07-2020** were confirmed.

3. Approval of R20 UG Syllabus for III and IV semester

- Scheme of III and IV Semesters for three UG programs was presented
- Scheme for BE CSE I to VIII Semester was presented
- Panel has suggested to move core courses such as OS, DCCN, etc., to starting semesters.
 - OS has been moved from V Sem to IV Sem
 - DCCN has been moved from VI to V Sem
- Sensors & Instrumentation is advised to be moved to V Semester and update the syllabus (include analog, microprocessor and microcontroller topics)
- Instead of sensors subject, add any new subject and Unit 1 and 2 of Sensors into BEE
- CAMP (L+P) can split it into Computer Organization Theory and the Microprocessors part is moved to V Semester and clubbed with Sensors & Instrumentation (L+P)
- Internet & Web Technologies advised to include the topics – concentrate more on java script, add bootstrap, node JS and json parsing, MVC
After Discussion it was resolved to have 2 hours theory and four hours practicals
- Move IOT and Cloud Computing from Track-2 to Track-5 of Software Systems Engineering
- Statistics text book by Neil Weiss to be included in P&S and also cover topics related to Regression and Time series analysis which will be more inclined to Data Science.
- Advised to include Hadoop GPU, API's in Data Engineering
- Add Data analysis (statistics) and visualization in Data Science Track
- Add Data Engineering in Data Science Track
- The panel suggested to change the subject from Network Security to IOT Security
- Keep Advanced Databases in Data Science Track and include the real time databases, parallel databases.
- In DBMS, latest editions of text books to be included. In DBMS Lab, experiments need to be updated. Advised to concentrate on PL/SQL programs.
- Advised to move searching and sorting topics to Unit-3 in Basics of Data Structures

Suggestions were considered

4. Scheme of R20 for UG V Semester to VIII Semester

Scheme of R20 for UG V Semester to VIII Semester was approved with suggestions to complete all core subjects before VI semester. All professional Electives to be categorized into different Tracks

Include Wireless communication Technology in DCCN or Professional Elective or Mobile Computing


5. Approval of R20 PG scheme and Syllabus of I,II,III,IV Semester

a. In the BOS meeting held on 25-07-2020, R19M.Tech approval was given for the redefined Course objectives and outcomes. The same scheme and syllabus will be with code change to R20 for the academic year 2020-21

b. The evaluation process is changed from 30/ 70 to 40/60 (CIE / SEE) as per the Institute guidelines of R20.

6. Any other item

- Members expressed that Engineering Exploration should be specific to programs. They approved the syllabus of Design thinking, AI tools and Techniques and suggested that it can be implemented for all students admitted from 2021-22 onward.
- Basics of Data Structure (T & L) for non CSE , IT, AI&DS branches was approved
- OOPS using Python(T&L) for BioTechnology was presented and approved
- Additional Minor Engineering and Honors degree courses were to be categorized in tracks and equivalent MOOCs/ courser etc to be identified
- Members from Industry expressed their willingness to extend their cooperation and coordination for providing Internship opportunities, Placements Assistance and Career Guidance for the benefit of the students.
- They expressed to extend their support in organizing Faculty Development Programs, Workshops Conferences on Latest emerging Technologies, to carry out Research Activities and Consultancy.


Chairperson, BOS



Department of Computer Science and Engineering

MINUTES of BoS (CSE)-MEETING

Department of CSE BoS meeting (online) for the program B.E. CSE was conducted on 04-06-2022 at 10:00 AM

Agenda

1. Confirmation of the minutes of the BoS (CSE) meeting held on 19.04.2021
2. Approval for BE (CSE) – V to VIII semester Syllabus
3. Revision of PPS and OOPS syllabus in I and II Semesters
4. Introduction of new Courses for M.Tech (CSE)
5. Introduction of Additional Minor Engineering Program
6. Approval of BE -AIML scheme and syllabus of III and IV Semesters
7. Any other item

The following members were present:

Sno	Name	Organization	Designation
1	Prof. P. Ravinder Reddy	Principal, CBIT(A)	Principal
2	Prof. Y. Ramadevi	Head, CSE Dept., CBIT	Chairperson
3	P. Radha Krishna	Head & Professor, Dept. of CSE, NITW.	Expert from University
4	Prof. Praveen Tammana	Assistant Professor, Dept. of CSE, IIT Hyderabad	Academic Expert
5	Dr. Nagender Kumar S	Associate Professor, SCIS, University of Hyderabad Central University	Academic Expert
6	Mr. Srikanth Srinivasan	Sr. Director & Head - Membership & Outreach	Member, Corporate
7	Mr. Akash Sinha	Head, Learning and Development, L4G, Hyderabad	Member from Industry
8	Mr. M. Nagarjuna Reddy	Team Manager, SAP Labs India Pvt. Ltd. (PG Alumni)	Member from Industry
9	Prof. M. Swamy Das	Professor, CSE Dept.	Member
10	Prof. K. Sagar	Professor, CSE Dept.	Member
11	Prof. China Ramu	Professor, CSE Dept.	Member
12	Prof. N. Ramadevi	Professor, CSE Dept.	Member
13	Dr. R. Ravinder Reddy	Associate Professor, CSE Dept.	Member
14	Dr. E. Padmalatha	Assistant Professor, CSE Dept.	Member
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19	Smt. P. V. Manohara Ruth	Assistant Professor, CSE Dept.	Member
20	Dr. Kolla Morarjee	Associate Professor, CSE Dept.	Invitee
21	Smt. I Srujana	Assistant Professor, CSE Dept.	Invitee

The Chairperson welcomed BoS members and briefed about the Institute Vision, Mission and Department Vision and Mission, New Program BE –AIML sanction from AY -2021-22 and NBA Accreditation.

1. Confirmation of minutes of meeting (online) held on 19.04.2021

Minutes of BOS meeting held on 19.04.2021 were confirmed.

2. Approval of R20 BE(CSE) Syllabus for V to VIII Semester

Prof. K Sagar presented Plan of Study for BE CSE and common Professional Electives Courses for all three programs. The same were approved with minor modifications.

The Members have made the following Suggestions/Recommendations/Observations.

- a. In MAD course, Flutter and IOS to be included.
- b. In Full stack Development, REST API, Angular JS to replace by React JS , GO language may be included(optional)
- c. Relevant Case Studies/ Usecases / Scenarios are to be included in Theory/ Practical's wherever possible.
- d. New textbooks and new editions may to be included for all the courses.

All the Suggestions/ Recommendations were incorporated while framing the syllabus.

3. Revision of PPS and OOPS syllabus in I and II Semesters

- a. The revised syllabus of the common course Programming and Problem Solving (22CSC01 & 22CSC02) is presented and the same was approved w.e.f ACY 2022-23
- b. The revised syllabus of the course Object Oriented Programming (22CSC03 & 22CSC04) syllabus) is presented and the same was approved w.e.f ACY 2022-23 offered to BE –CSE, CSE-(AI &ML), CSE(IoT), BE-AI&ML, BE-IT, BE-AIDS

4. Introduction of new Courses from Emerging areas for M. Tech (CSE)

List of New courses were approved for inclusion in R20 M. Tech (CSE)

- | | |
|--|-------------------------------------|
| 1) Research Methodologies in CSE and IPR | 8) Soft Computing(core to elective) |
| 2) Advanced Networks | 9) Video Analytics |
| 3) Advanced Networks Lab | 10) Cyber Security |
| 4) Advanced Database | 11) Cloud Computing Lab |
| 5) High Performance computing | 12) Soft Computing Lab |
| 6) Advanced Deep Learning | 13) Full Stack Development |
| 7) Cloud Computing | 14) Natural Language Processing |
| | 15) Robotics |

5. Revision of Additional Minor Engineering Programmes and introduction of new Minor Engineering Programme in Advanced Web Development (AICTE-LITE)

- a. The proposed Scheme and syllabus of additional minor engineering in Computer Engineering, AI &ML, Cyber Security and Internet of Things are approved.

- b. The proposed scheme and syllabus of AICTE-LITE Minor Degree in Advanced Web Development was approved.

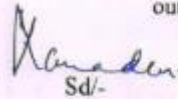
6. Approval of BE –AI&ML scheme and syllabus of III and IV Semesters

Prof. M Swamy Das presented the plan of study and syllabus of III and IV semesters for BE-Artificial Intelligence and Machine Learning

- a. Students admitted in 2021-22 will study BEE Theory only in III Semester and Robotics and Drones in IV semester.
- b. Students admitted in AY 2022-23 will study BEE Theory in I Semester and Robotics and Drones in II semester.
- c. Students admitted from AY 2022-23 will study Cognitive and neuroscience in place of BEE (III semester). Similarly they will study Simulation and Modeling in Place of Robotics and Drones (IV semester).
- d. The syllabus of V unit of Data Base Systems may be reviewed. However, the syllabus was adapted from AICTE model curriculum
- e. The title of Building Large, Reliable Software Systems is to be replaced. It is proposed to Principles of Software Construction.

7. Any other item

- a. PSOs for BE–CSE, BE-CSE (AI & ML), BE-CSE (IoT, CS& BCT), BE-AI & ML were revised and approved.
- b. For Awarding honors degree in Computer science and Engineering students shall earn 20 credits from Professional Electives (not studied in regular program)/ emerging areas.
- c. The proposed Open Elective courses offered to other departments are approved
- d. Members from Industry expressed their willingness to extend their cooperation and coordination for providing Internship opportunities, Placements Assistance and Career Guidance for the benefit of the students.
- e. They expressed to extend their support in organizing Faculty Development Programs, Workshops Conferences on Latest emerging Technologies, to carry out Research Activities and Consultancy.


Sd/-

Chairperson, BoS

20CSE21**DEEP LEARNING
(Professional Elective – IV)**

Instruction	3 Hours per week
Duration of End Examination	3 Hours
Semester End Examination	60 Marks
Continuous Internal Evaluation	40 Marks
Credits	3

Pre-requisites: Artificial Intelligence, Machine Learning.

Course Objectives: The objectives of this course are,

1. To learn Deep learning techniques and their applications.
2. To acquire the knowledge of neural network architectures, Deep learning methods, models and algorithms.
3. To understand CNN and RNN algorithms and their applications.

Course Outcomes: On successful completion of the course, students will be able to,

1. Understand various learning models.
2. Design and develop various Neural Network Architectures.
3. Understand approximate reasoning using Convolution Neural Networks.
4. Analyze and design Deep learning algorithms in different applications.
5. Ability to apply CNN and RNN techniques to solve different applications.
6. Evaluate the Performance of different models of Deep learning networks.

UNIT - I

Introduction: Historical Trends in Deep Learning, McCulloch Pitts Neuron, Thresholding Logic, Perceptrons, Perceptron Learning Algorithm. Representation Power of MLPs, Sigmoid Neurons, FeedForward Neural Networks, Representation Power of Feedforward Neural Networks, Backpropagation, **Historical Trends in Deep Learning.**

Optimization: Gradient Descent (GD), Momentum Based GD, Nesterov Accelerated GD, Stochastic GD, AdaGrad, RMSProp, Adam.

UNIT - II

Autoencoders: relation to PCA, Regularization in autoencoders, Denoising autoencoders, Sparse autoencoders, Contractive autoencoders, **Regularization:** Bias Variance Tradeoff, L2 regularization, Early stopping, Dataset augmentation, Parameter sharing and tying, Injecting noise at input, Ensemble methods, Dropout, Greedy Layer wise Pre-training, Better activation functions, Better weight initialization methods, Batch Normalization.

UNIT - III

Convolutional Neural Network: The Convolution Operation, Motivation, Pooling, Convolution and Pooling as an Infinitely Strong Prior, Variants of the Basic Convolution Function, Structured Outputs, Data Types. LeNet, AlexNet, ZF-Net, VGGNet, GoogLeNet, ResNet, Visualizing Convolutional Neural Networks, Guided Backpropagation, Deep Dream, Deep Art, Fooling Convolutional Neural Networks.

UNIT – IV

Recurrent Neural Networks, Backpropagation through time (BPTT), Vanishing and Exploding Gradients, Truncated BPTT, GRU, LSTMs.
Encoder Decoder Models, Attention Mechanism, Attention over images, Introduction to Transformers.

UNIT – V

Generative Adversarial Networks (GANs): Introduction, Discriminator, Generator, Activation, Common activation functions for GANs, BCE loss, Conditional GANs, Controllable generation, real life GANs.

Text Books:

1. Goodfellow. I, Bengio. Y. and Courville. A., "Deep Learning ", MIT Press, 2016.
2. Josh Patterson, Adam Gibson "Deep Learning: A Practitioner's Approach", O'Reilly Media, 2017.
3. Ganguly Kuntal, "Learning generative adversarial networks: next-generation deep learning simplified", Packt Publishing, 2017.

Suggested Reading:

1. Tom M. Mitchell, "Machine Learning ", MacGraw Hill, 1997.
2. LiMin Fu, "Neural Networks in Computer Intelligence", McGraw-Hill edition, 1994.
3. Umberto Michelucci "Applied Deep Learning. A Case-based Approach to Understanding Deep Neural Networks" Apress, 2018.
4. Giancarlo Zaccane, Md. RezaulKarim, Ahmed Menshawy "Deep Learning with TensorFlow: Explore neural networks with Python", Packt Publisher, 2017.
5. Rothman, Denis, "Transformers for Natural Language Processing: Build innovative deep neural network architectures for NLP with Python, PyTorch, TensorFlow, BERT, RoBERTa, and more", Packt Publishing Ltd, 2021.

Online Resources:

1. https://onlinecourses.nptel.ac.in/noc18_cs41/
2. https://onlinecourses.nptel.ac.in/noc22_cs22/
3. https://onlinecourses.nptel.ac.in/noc19_cs85/

ANNEXURE-I

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (A), HYDERABAD-75 MANDATORY INTERNSHIP PROGRAMME (R-20)

I. Objectives

According to AICTE “Internship Policy Guidelines & Procedures (April 2019)”, CBIT Implements mandatory internships from the Academic Year 2020-21 with the following objectives:

- Exposing the students to the industrial environment
- Provide possible opportunities to learn, make them to understand and sharpen them to the real time technical/managerial skills required at the job
- Expose with the current technological developments relevant to program domain
- Create conditions conducive to quest for knowledge and applicability in job
- Apply technical knowledge to real world industrial situations
- Gain experience in technical reports/projects
- Understand Engineer's responsibilities and ethics
- Familiarize with various materials, processes, products and quality control
- Promote academic, professional and / or personal developments
- Provide interaction future employers, make students aware of with the conditions of rural or socially deprived brothers & sisters through Rural /Social Internship
- Making the students to come up with innovative solutions leading to positive impact
- Provide opportunity to understand the social, economic and administrative considerations that influence the working environment of industrial organizations and psychology of the workers and their habits, attitudes and approach to problem solving

Accordingly, CBIT shall be implementing the internship program as mandatory for the students who have taken admission from 2020-21 onwards (Regulation R-20)

II. Internship Credit Framework

For the implementation of mandatory internships the following academic credit framework is defined:

- Every student has to undergo for a minimum of THREE internship programmes during their study of B.E/B.Tech Degree program.
- The internship programs may include the activities of Industrial training/ Govt./ NGO/ MSME/ Rural Internship/ Innovation/ Entrepreneurship/ National Skills Qualification Framework(NSQF) levels 3 to 5 and intra/inter institutional training or workshops.
- The credits earned shall be considered for the award of degree. To earn one (1) credit, student has to put up 40 to 45 hours of work. i.e. a full-time intern is expected to spend 45 hours per week on Internship, Training, Project work, Seminar activities etc.
- Internship may be full-time or part-time. It may be full-time during the summer/winter vacation and part-time during the academic session.
- Internship schedules shall be notified by the institution time to time. The internship duration and academic credit requirements are given in Table: 1.

Table 1: Internship Frame work

Sno.	Schedule	Activities	Duration	Credits
1	Summer / Winter vacation (2 nd / 3 rd Semester)	MOOCs or Inter/ Intra Institutional Activities	3-4 weeks or 90 hrs	2 Credits
2	Summer / Winter vacation (4 th / 5 th Semester)	Industrial / Govt. /NGO / MSME/ Rural Internship/ Innovation/ Entrepreneurship/ NSQF level 3, 4,5	3-4 weeks or 90 hrs	2 Credits
3	Summer / Winter vacation after (6 th Semester)	Industrial / Govt. /NGO / MSME/ Rural Internship/ Innovation/ Entrepreneurship/ NSQF level 3, 4,5	5-6 weeks or 135 hrs	3 Credits

III. Implementation Guidelines

Career Development Center (CDC) shall arrange internship for the students in industries/organization after second, fourth and sixth semester(s). CDC guides the students to use AICTE internship Portal for arranging and managing internships. Students are allowed to register for internship through either AICTE Portal or Institute defined registration framework.

Process to be followed by the students for carrying out internships:

1. Students may apply for internships through the AICTE Portal or through CDC of the institute by filling the application form IAP-101.
2. Industry shall scrutinize the students based on their criteria and communicate a provisional offer or confirmation letter to the student.
3. If students apply through CDC, then CDC shall nominate the students for various opportunities accordingly by issuing NOC(IAP-104).
4. The respective head of the department shall assign a faculty mentor.
5. Student shall undergo internship/industrial training at the concerned Industry/Organization by submitting the form, IAP-103.
6. During the internship, Faculty Mentor will evaluate the performance of students twice either by visiting the Industry/Organization or through obtaining periodic reports from students.
7. Student shall submit internship report to the industry/organization at the end of internship program.
8. On successful completion of the Internship, Industry/Organization shall issue Internship Certificate to the students
9. All the students should maintain discipline, professional ethics and follow the health and safety precautions during internship.

IV. **RECORDS/REPORTS TO BE MAINTAINED BY THE STUDENT:** Students need to maintain Daily Diary/Log and submit a report at the end of the internship.

a) Student's Diary/Daily Log: The purpose of writing diary is to cultivate the habit of documenting and to encourage the students to search details which may develops thought process and reasoning abilities. The students should record the observations, impressions, information gathered and suggestions given, if any It should contain the sketches & drawings related to the observations made by the students. Students shall be ready to show the diary to the Industry supervisor or the Faculty Mentor at any point of time. Failing to produce the same, Intern may be debarred for the remaining

period of his/her internship. Daily diary needs to be submitted to Faculty Mentor at the end of Internship along with the attendance record and an evaluation sheet duly signed and stamped by the industry. Daily diary is evaluated on the basis of the following criteria:

- Regularity in maintenance of the diary/log
- Adequacy and quality of information recorded
- Drawing, sketches, and data recorded.
- Thought process and recording techniques used
- Organization of the information

b) Internship Report: At the end of the internship, each student should prepare a comprehensive report to indicate what he/she observed and learned in the training/internship period. For this preparation student may take the help of Industry supervisor/Faculty Mentor and may use the daily diary. It should be signed by the internship supervisor. The report will be evaluated by the Industry Supervisor on the basis of the following criteria:

- Originality
- Adequacy and purposeful write-up
- Organization, format, drawings, sketches, style, language etc.
- Variety and relevance of learning experience
- Practical applications, relationships with basic theory and concepts taught in the course

V. Evaluation of Internship: The industrial training/internship of the students will be evaluated in three stages:

- a) Evaluation by the Industry (in the scale of 1 to 10 where 1-Unsatisfactory; 10-Excellent)
- b) Evaluation by faculty Mentor on the basis of site visit(s) or periodic communication (15 marks)
- c) Evaluation through seminar presentation/Viva-Voce at the Institute(This can be reflected through marks assigned by Faculty Mentor (25 marks))

Evaluation through Seminar presentation/Viva-Voce at the institute: Students shall give a seminar before an *Expert Committee* constituted by college (Director, HoD/Senior faculty, mentor and faculty expert from the same department) based on his/her training/internship carried out

. The evaluation will be based on the following criteria:

- Quality of content presented
- Proper planning for presentation
- Effectiveness of presentation
- Depth of knowledge and skills
- Attendance record, daily diary, departmental reports shall be analyzed along with the internship Report

Monitoring/ Surprise Visits: During the internship program, the faculty mentor makes a surprise visit to the internship site, to check the student's presence physically. If the student is found to be absent without prior intimation to the concerned industry, entire training/internship may be canceled. Students should inform through email to the faculty mentor as well as the industry supervisor at least one day prior to avail leave. A student is eligible to avail 1-day leave in 4 weeks and 2 days in 6 weeks of the internship period apart from holidays and weekly offs.