CBC

EXPERIENCE

EMPLOYABILITY

CBC

CERTIFICATIONS

KNOWLDEGE

Industry Courses

Certifications/ Skill & Knowledge Training

AI & ML/IOT/ARVR

B.TECH

COMPETENCY BUILDING AND CONSULTANCY

Engineer Your Future:
Build Competency Today!

IARE
INSTITUTE OF
AERONAUTICAL ENGINEERING

IARE
EDUCATION FOR LIBERATION

NAAC
ACCREDITATION

A++ GRADE

NBA
NATIONAL BOARD
of ACCREDITATION

nirf
INDIA RANKINGS 2023

TOP 200
ENGINEERING RANK
151-200

TOP 100
INNOVATION RANK
51-100

24
YEARS OF
Excellence

ABOUT CBC

Institute of Aeronautical Engineering (IARE) implemented a new strategic vision for Competency Building, emphasizing skill development, reskilling, upskilling, and enhancing student engagement in career planningand job success. This plan highlights IARE's commitment to fostering student's professional development through intentional assessment of learning and engagement.
The Competency Building Committee (CBC)has established goals and objectives and developed a comprehensive career skill development frameworkfocused on faculty/student learning and outcomes assessment.

VISION AND MISSION

VISION

CBC seeks to establish an environment that will enhances the professional and academic standards of our faculty as well as students. The purpose of our program is to develop into well rounded individuals capable of taking on new challenges.

MISSION

Increase student's chances of finding a placement by organizing practice sessions and giving skill training on a variety of value-added courses. Transform students into technical and software engineers capable of facing challenges on both a personal and professional level.

Strategic Priorities

Skill Development

Build and enhance specific skills that are crucial for job performance. This could include technical skills communication skills, problem solving skills and more.

Performance Improvement

Address skill gaps to improve overall performance. Students who understand the required skills are more likely to excel in their roles and positively contribute to the institute goals

Adaptation

Develop adaptation by building a wide variety of skill sets that allow individuals to navigate and excel in a dynamic and evolving work environment.

Succession Planning

Identify and nurture students with the skills required for future job roles to ensure succession planning.

Skill Gaps

There is a constant disparity between the skills currently possessed by faculty and students with the ever-changing industry standards and technological advancements. Conducting a skill gap analysis is instrumental in pinpointing the specific abilities necessary to meet academic goals, providing guidance for faculty and student development activities and hiring practices. CBC platform is crucial for upskilling faculty as well as preparing students to be industry-ready.

Process

Competency is the integration of knowledge (what one knows), skills (what one can do), and dispositions (attitudes and behaviours) that enable effective performance in various contexts.
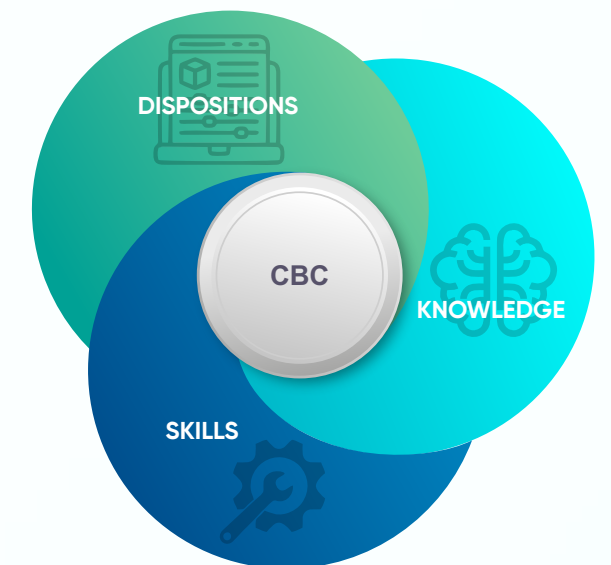
Essential Eight

Competency Building Platforms & Tools:
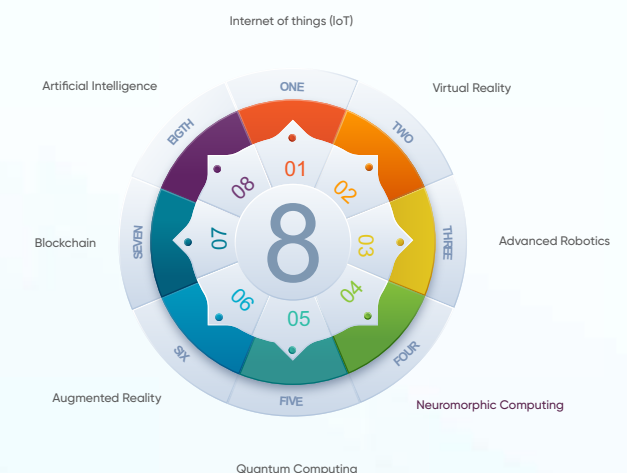
	CSE & IT	CSE (AI & ML)	CSE (DS)	CSE (CS)
Competency Building Platforms & Tools	Cloud Computing	Gen AI	Python	John the Ripper
		MXNet	R Programming	Metasploit
	Mobile and Web Application Development	Caffe	Hadoop	Cain & Abel
			SQL	Tor
		Theano		SOAR
	AI Augmented Software Development	Computer vision	Apache Spark	Splunk
				Forcepoint
		Natural Language Processing (NLP)	Tableau	TrueCrypt
	Internet of Things (IoT)		Power BI	Penetration Testing Tools
		Microsoft Cognitive Toolkit (CNTK)	Google Analytics	Malwarebytes

Computer Science and Engineering & Information Technology

Computer Science and Engineering (CSE) and Information Technology programs equip students with skills in programming, algorithm development, hardware design, and system analysis for careers in software development, hardware design, and related fields.

AI augmented software development incorporates AI into the software development process to improve productivity and quality, enhancing students' capabilities in leveraging AI for innovative software solutions.

CSE & IT Framework and Tools

Cloud computing provides on demand computing services over the internet, essential for building students' competencies in modern IT infrastructure and resource management.

Mobile and web application development involves creating software for mobile devices and web platforms, equipping students with skills in modern software development and cross platform compatibility.

IoT connects devices to collect and exchange data for automation and efficiency, important for students to develop competencies in emerging technologies and data driven decision making.

Artificial Intelligence and Machine Learning

Artificial Intelligence and Machine Learning Empower students to create intelligent systems capable of problem solving, language understanding, and self-improvement through data driven pattern recognition and prediction

AI & ML Framework and Tools

Gen AI: Prepares students to advance AI towards general intelligence with capabilities in adaptability, creativity, and ethical decision making.

MXNet: Equips with skills in efficient and scalable distributed computing for training complex neural networks.

Caffe: Trains in fast computation and expressive architecture for computer vision applications.

Theano: Teaches students efficient mathematical computation and optimization for deep learning tasks.

Computer Vision: Enables to develop technology that can interpret and analyze visual data, facilitating innovations in image recognition and object detection.

Natural Language Processing (NLP): Equips to build systems that understand and generate human language for applications like chatbots and translation services.

Microsoft Cognitive Toolkit (CNTK): Prepares students to build and deploy neural network models using efficient training algorithms and distributed computing.

Data Science

Trains students to extract insights from data using statistical analysis, machine learning, and visualization, enhancing decision making across industries through programming proficiency and domain specific knowledge.

Data Science Framework and Tools

Python: Equips students to perform data manipulation, analysis, and visualization using libraries like Pandas, NumPy, and Matplotlib.

R Programming: Trains students in statistical computing and graphics with extensive libraries and visualization tools.

Hadoop: Trains students in distributed storage and processing of large datasets, often used with tools like Apache Hive and Apache Pig.

SQL: Enables students to manage and query relational databases using tools like MySQL, PostgreSQL, and Microsoft SQL Server.

Apache Spark: Equips students to handle big data processing for large.scale analytics and machine learning tasks.

Tableau: Allows students to create interactive dashboards from various data sources without extensive programming skills.

Power BI: Trains students to develop interactive reports and dashboards, integrating well with other Microsoft products.

Google Analytics: Provides students with skills to track and report website traffic, offering insights into user behaviour and performance.

Cyber Security

Cyber security is all about to protect digital systems, networks, and data from attacks and unauthorized access using advanced techniques and technologies.

Cyber Security Framework and Tools

John the Ripper: Trains students in password cracking techniques, primarily using dictionary attacks on encrypted passwords.

Metasploit: Equips students to develop, test, and execute exploit code for penetration testing and system vulnerability assessments.

Cain & Abel: Prepares students to recover various types of passwords through methods like network packet sniffing and brute force attacks.

Tor: Teaches students to use anonymization techniques to conceal their location and usage, and access the internet and dark web securely.

Security Orchestration, Automation, and Response (SOAR): Trains students to integrate security tools and automate incident response to enhance cybersecurity operations.

Splunk: Trains students to search, monitor, and analyze big data for security information and event management (SIEM) and IT infrastructure analysis.

Forcepoint: Provides students with knowledge of cybersecurity solutions for protecting data and networks, including web and email security.

TrueCrypt: Educates students on creating encrypted disks and file containers, despite its discontinuation and the need to migrate to alternatives.

Penetration Testing Tools: Equips students to simulate cyber-attacks to identify and mitigate system vulnerabilities before exploitation.

Malwarebytes: Prepares students to detect and remove malware, adware, and other unwanted programs across various platforms.

Our Specialized NICHE Skill Development Paths

Developing AR/VR Solutions: Training in creating interactive AR overlays and immersive VR experiences using advances in computer vision, AI, and IoT.

Machine Learning: Skills to handle complex datasets with multiple variables for building advanced predictive models.

Advanced Robotics: Integration of AI into robotics for autonomous, real time decision making and interaction with dynamic environments.

Blockchain: Creating transparent, secure, and cost effective systems for storing, monitoring, and transferring data and assets.

5G Technology: Leveraging high speed, low latency connectivity to revolutionize industries like robotics, healthcare, and transportation.

Mobile and Web Application Development: Mobile and web application development involves creating software for mobile devices and web platforms, equipping students with skills in modern software development and cross platform compatibility.

Cloud Application Development: Designing scalable, resilient cloud based solutions using leading cloud platforms and service models.

Cyber Security: Comprehensive training in various cybersecurity aspects to protect organizational assets from evolving cyber threats.

Data Analytics: Utilizing statistical, mathematical, and programming techniques to uncover insights and automate data processing using ML algorithms and advanced analytics.

Software Engineering and Testing: Preparation for software development with a focus on testing, verification, and validation across a wide range of applications.

Sales Force and ServiceNow Certifications: These certifications validate expertise in Salesforce platform administration, development, and consulting, while Service Now certifications demonstrate proficiency in managing and implementing Service Now's IT service management solutions.
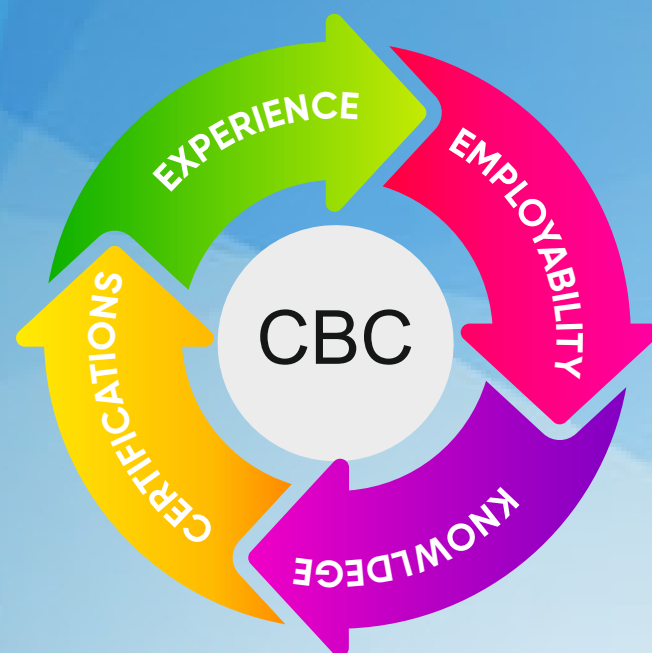
Self-directed learning

CBC utilize the Balanced Scorecard' to enhance Self-Directed learning for students with diverse learning abilities.

Self-Directed Learning is positively associated with academic efficiency and performance, and contributes to learners' curiosity, creativity, independent learning, motivation, and life satisfaction.

Crucial to success

Poor Current Practice

Good Current Practice

Low Intervention Priority
You successfully hit goals but do not perform the practice well. Low priority intervention but must be monitored.

Active Learner – Inadequate Practice

Performs Well
You are hitting your goals and no intervention is required.

Advanced Learner

BALANCED SCORE CARD

High intervention priority
You are not successfully hit goals or perform your practice well. High intervention.

Slow Learner

Performance Satisfactory
You perform the practice well but do not successfully hit goals. No intervention required.

Active Learner – More Insightful

Not crucial to Success

COMPETANCY BUILDING & CONSULTANCY

BALANCED SCORE CARD

Skill and Knowledge Development

Student Information

Name: _____

Student ID: _____

Department: _____

Signature of Student: _____ Date: _____

Signature of Advisor/ Mentor: _____ Date: _____

Engineer Your Future: Build Competency Today!

Student Success Balanced Scorecard Approach for Measuring Student Engagement

The Balanced Scorecard (BSC) is a strategic tool that links a student's growth to their goals, measures, targets, and initiatives, providing a roadmap for acquiring skills, knowledge, and dispositions to improve efficiency.

The Division of CBC proactively monitors student progress using balanced scorecards for skill and tool certifications from leading global organizations like Salesforce, ServiceNow, AWS, and Microsoft Azure etc.

Outcomes of the Balanced Scorecard

Implementing the structured Balanced Score Card will yield several significant outcomes for students, b oth in their academic journey and their professional careers, Such as

- **Industry-Recognized Credentials:** These certifications serve as proof of the students' capabilities and knowledge, providing them with a competitive edge in the job market.

- **High Impact Placements and On Job Success:** Secure top-tier job placements and consistently perform at a high level to advance in your career.

- **Higher Leverage for Quick Succession and Adoption:** Quickly adapt to new roles and responsibilities, positioning student for rapid career progression.

- **Employability:** Have the attributes, skills, and knowledge to effectively navigat e the job market and secure employment.

Expected Score

CBC has developed a comprehensive Balanced Scorecard that takes into account students' cognitive levels, learning abilities, knowledge, and skills at various stages. This approach aims to ensure that students achieve key target values on the scorecard, enabling them to secure top industry placements, high -impact salaries, and better career opportunities.

Criteria	Weightage	Target Score		
		Advanced Learner	Active Learner	Slow Learner
Certifications *(10 Marks Each)*	50 (5 x 10)	40	30	20
Minor Project *(5 Marks Each)*	10 (2 x 5)	5	5	5
Summer Internship / SRI / GRIP *(5 Marks)*	5 (1 x 5)	5	5	5
FSI / Research Internship Abroad / Paid Internship in company *(10 Marks)*	10 (1 x 10)	10	10	–
Accelerated Course	✓	✓	✓*	–
Paper Publication in Conference *(5 Marks)*	5 (1 x 5)	5	5	5
Paper Publication in Journal *(10 Marks)*	10 (1 x 10)	10	–	–
Placement - Secure Full-time Employment after finishing internship / aiming at CTC above Rs. 10 LPA *(10 Marks)*	10 (1 x 10)	10	10	10
Total score	100	85	65	45

* Allowed for CGPA ≥ 7.5 and no current backlogs

BALANCED SCORECARD

FOCUS AREA	CERTIFICATION	AGENCY	SCORE	ASSESSMENT
SEMESTER – I				
Basic Programming	Oracle Certified Associate, Java SE Programmer	Oracle	10	
SEMESTER – II				
Basic Programming	Python Institute Certified Entry-Level Python Programmer	Python Institute	10	
SEMESTER – III				
Advanced Programming	Certified Associate in Python Programming (PCAP)	Python Institute	10	
Database Management	Oracle Certified Associate (OCA) – Oracle Database 12c	Oracle	10	
SEMESTER – IV				
Cloud Computing	AWS Certified Solutions Architect – Associate	Amazon Web Services	10	
Full stack Development	IBM Full Stack Cloud Developer Professional Certificate	IBM	10	
Mobile Application Development	Google's Associate Android Developer Certification	Google	10	
Fast Path	Accelerated Course (Select from Professional / Open Electives)	IARE / Equivalent NPTEL Course	-	
Internships	Summer Internship Certifications	IARE – SRI / GRIP/ Industry Connects	5	
SEMESTER – V				
Software Development	Certified Secure Software Lifecycle Professional (CSSLP) / Domain 8 - Certified Information Systems Security Professional (CISSP)	ISC2	10	
Cybersecurity	CompTIA Security+	CompTIA	10	
Skills Development	Salesforce Certified Administrator / Developer	Salesforce	10	
Fast Path	Accelerated Course (Select from Professional / Open Electives)	IARE / Equivalent NPTEL Course	-	
SEMESTER – VI				
Data Science and Analysis	IBM Data Science Professional Certificate	IBM	10	
Skills Development	ServiceNow Certified System Administrator	ServiceNow	10	
Fast Path	Accelerated Course (Select from Professional / Open Electives)	IARE / Equivalent NPTEL Course	10	
Real-world Experience and Skills Development	Summer Internship Certifications	IARE – SRI / GRIP/ Industry Connects	5	
	Paper Presentation in Conference	Scopus / SCI / WOS	5	
SEMESTER – VII				
Fast Path	Accelerated Course (Select from Professional / Open Electives)	IARE / Equivalent NPTEL Course	10	
Advanced Topics and Specializations	Microsoft Certified: Azure Fundamentals	Microsoft	10	
Placement	Google Professional Cloud Architect	Google Cloud	10	
	Placement aiming at CTC above Rs. 10 LPA	Industry	10	
Internships	Paid Internship in company / Research Internship Abroad	Industry	10	
SEMESTER – VIII				
Professional Skills and Capstone Projects	Project Management Professional (PMP) / Certified ScrumMaster (CSM)	PMI	10	
	Paper publication in Journal	Scopus / SCI / WOS	10	
Employment	Secure Full-time Employment after finishing internship	Industry	10	
ADD ON CERTIFICATIONS				
Software Development	DevOps Certification	DevOps Institute	10	
Deep Learning	NVIDIA Deep Learning AI associate	NVIDIA	10	
Programming	TensorFlow Developer certification	TensorFlow	10	
Big Data	Cloudera Certified Associate (CCA) Data Analyst	Cloudera	10	
Containerization	Certified Kubernetes Administrator (CKA)	LINUX foundation	10	
	Certified Kubernetes Application Developer (CKAD)	LINUX foundation	10	
ONGOING LEARNING				
Continuous Learning	GitHub and GitLab Badges / GitHub Copilot	GitHub/GitLab	-	

Professional Competency & Skill Enhancement Framework

Students are encouraged to actively engage in the Balanced Scorecard knowledge and skill enhancement program to improve their career prospects.

SEMESTER – I	Basic Programming in Java	NPTEL Suggested link: https://onlinecourses.nptel.ac.in/noc22_cs47/preview By: Prof. Debasis Samanta, IIT Kharagpur Minor Project: • Library Management System • Student Management System • Bank Account Management • Simple Chat Application • Inventory Management System	**SEMESTER – II**	Basic Programming in Python	NPTEL Suggested links: https://onlinecourses.nptel.ac.in/noc24_cs57/preview By: Prof. Sudarshan Iyengar, IIT Ropar Minor Project • Todo List Application • Weather Application • Agriculture Application • Currency Converter • Simple Blog System • Basic Calculator
SEMESTER – III	Advanced Programming	NPTEL Suggested links: https://nptel.ac.in/courses/106106145 By: Prof. Prof. Madhavan Mukund, IIT Madras Minor Project: • Web Scraper • Expense Tracker • Game Development • Simple Blog • Quiz App	**SEMESTER – IV**	Cloud Computing	NPTEL Suggested links: https://onlinecourses.nptel.ac.in/noc21_cs14/preview By: Prof. Soumya Kanti Ghosh, IIT Kharagpur Minor Project: • Website Hosting • Cloud Storage Integration • Basic Serverless Function • Static Website Deployment • Cloud-Based To-Do List
	Database Management	NPTEL Suggested links: https://onlinecourses.nptel.ac.in/noc22_cs91/preview By: Prof. Partha Pratim Das, IIT Kharagpur Minor Project: • Contact Manager • Library Management System • Student Records System • Employee Management System • Inventory Management System • Movie Database		Mobile Application Development	NPTEL Suggested links: https://archive.nptel.ac.in/courses/106/106/106156/ By: Prof. Gourav Raina, IIT Madras Minor Project: • Expense Tracker • Fitness Tracker • Social Media Feed • Book Collection Manager • Travel Booking App
				Internship	• Summer Research internship (SRI) • Global Research & Internship Program (GRIP)
SEMESTER – V	Software Development	NPTEL Suggested links: https://onlinecourses.nptel.ac.in/noc20_cs68/preview By: Prof. Rajib Mall, IIT Kharagpur Minor Project: • Personal Finance Manager • Task Scheduler • File Encryption/Decryption Tool • Basic Blogging Platform • Project Management Tool	**SEMESTER – VI**	Data Science and Analysis	NPTEL Suggested links: https://nptel.ac.in/courses/106106179 By: Prof. Shankar Narasimhan, IIT Madras Minor Project: • Exploratory Data Analysis (EDA) • Basic Data Visualization • Simple Linear Regression • Descriptive Statistics Summary
				Publication	Paper Presentation in Conference / Publication in Journal from Project Based Learning / Research based Learning
				Internship	• Summer Research internship (SRI) • Global Research & Internship Program (GRIP)
SEMESTER – VII	Cloud Architecture	NPTEL Suggested links: https://archive.nptel.ac.in/courses/106/102/106102229/ By: Smruthi R Sarangi, IIT Delhi Minor Project: • Static Website on Cloud • Simple Web Server Deployment • Basic Cloud Storage Setup • Serverless Function Deployment • Cloud-Based Database	**SEMESTER – VII**	Major Project	• Global Research & Internship Program (GRIP) • Full Semester Research Internship - Abroad • Paper publication in Scopus / WOS indexed Journal • Science and Technology Start-Up • Patent Publication / Grant

Contact us

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