



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

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

www.sathyabama.ac.in

SCHOOL OF BUILDING AND ENVIRONMENT

DEPARTMENT OF CIVIL ENGINEERING

BOARD OF STUDIES MEETING - Academic year 2020-2021

The periodic Board of studies meeting - Virtual, for the Department of Civil Engineering, School of Building and Environment will be held on 30.06.2020 at 4.00 pm

Internal members

1. Dr.Devyani Gangopadhyay, Dean, School of Building and Environment
2. Dr.S.Packialakshmi, Associate Professor, Department of Civil Engineering
3. Dr.R.Padmapriya, Associate Professor, Department of Civil Engineering
4. Dr.V.Sampathkumar, Professor, Department of Civil Engineering
5. Dr.S.Nandhakumar, Assistant Professor, Department of Civil Engineering

External members

1. Dr.R.Santhakumar, Professor, Department of Civil Engineering, NITTTR, Chennai
2. Dr.R.Saravanan, Associate Professor, CWR, Anna University, Chennai

Agenda:

1. Review of Curriculum for the upcoming semester courses
2. Implementation of Industry 4.0 for UG and PG Programmes

Convenor/Dean

HOD

Expert member



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DEPARTMENT OF CIVIL ENGINEERING

Minutes of the BOS Meeting - Academic year 2020-2021

The Board of Studies Meeting - Virtual for both UG and PG programme is held on 30th June, 2020 at 4.00 pm.

Members Present

- | | |
|--|---------------|
| 1. Dr.Devyani Gangopadhyay
Dean , School of Building and Environment | Convenor |
| 2. Dr.R.Santhakumar
Professor, Department of Civil Engineering, NITTTR, Chennai | Expert Member |
| 3. Dr.R..Saravanan
Associate Professor, CWR, Anna University, Chennai | Expert Member |
| 4. Dr.R.Padmapriya
Associate Professor, Department of Civil Engineering | Member |
| 5. Dr.S.Packialakshmi,
Associate Professor, Department of Civil Engineering | Member |
| 6. Dr.V.Sampathkumar,
Professor, Department of Civil Engineering | Member |
| 7. Dr.S.Nandhakumar
Assistant Professor, Department of Civil Engineering | Member |



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After a brief introduction, the agenda were taken up for discussion and as per the constructive suggestions given by Dr. R. Santhakumar, Professor, Department of Civil Engineering, NITTTR, Chennai and Dr. R. Saravanan, Associate Professor, CWR, Anna University, Chennai, the following discussions were taken up into considerations;

- The Curriculum for the courses in the upcoming semester is reviewed and met out the requirements of skill development / Employability / Entrepreneurship liability for the students.
- Introduction of industry oriented and emerging technologies in various disciplines in the Industry 4.0 will be helpful for the students to industry ready within their course period
- The long duration of internship training may be included in program curriculum to expand the knowledge on real time industrial projects to the students.
- The students must acquire knowledge on skill development courses in relation with industry and additional credits can also be given for the same.

Convenor/Dean

(S. PACKIALAKSHMI)

HOD

1. *[Signature]*
2. *[Signature]* (Dr. R. Saravanan)

Expert member

SAIC4001	INDUSTRY 4.0	L	T	P	Credits	Total Marks
		2	0	2	2	100

UNIT 1 ADVANCED TECHNOLOGY AND ADVANCED MATERIALS**7 Hrs.**

Advanced electro-optical sensing technology-active, passive multi-spectral and hyper spectral imaging; electronic beam steering; vacuum technology, surface and coating technology, health care technology, Nanotechnology- Nanomechanics, Nano optoelectronics; energy storage technology-next generation Li-based Batteries, Hydrogen storage, solar photovoltaic's, Flexible electronics. Intellectual Property Rights - case studies governing/pertaining to Materials/Technology.

UNIT 2 TRANSFORMING TECHNOLOGIES IN BIOENGINEERING**7 Hrs.**

Establishment of smart biotechnology factory, Artificial intelligence in Bioprocess technology, Omics - Big data analysis through automation, 3D bio printing for tissue engineering. Simulation tools, RSM and Box model. Cyber physical system based telemedicine, diagnosis and therapeutics through real time biosensors. Bionanotechnology. Intellectual Property rights (IPR): Case Studies.

UNIT 3 ADVANCEMENTS IN SUSTAINABLE BUILT ENVIRONMENT**7 Hrs.**

Introduction - Technological developments in Architectural, Engineering and Construction (AEC) - Building Information Modelling (BIM) using Cloud computing technology and Internet of things (IoT) - Unmanned Aerial Vehicles, sensors - Additive manufacturing in construction - Concrete 3D printing - Materials used - Lightweight and functionally graded structures - Net Zero Energy buildings, Bioswales, Biofiltration pond, Ecosan systems- Recent developments in Waste water Management, Air pollution control, waste disposal - Integration of energy, water and environmental systems for a sustainable development- Emerging Technologies: Robot Highway- Vertical farming - Intellectual Property rights: Case studies.

UNIT 4 SMART MANUFACTURING**8 Hrs.**

Smart factories and interconnection, Smart Manufacturing - automation systems, Additive Manufacturing, Smart grids, Micro Electro Mechanical Systems (MEMS), Stealth technology, Metal Finishing, Self-propelled vehicles, e mobility, Green fuels, drones - unmanned aerial vehicles(UAVs), aerodynamics. Robotic Automation and Collaborative Robots - Augmented reality and haptics, engineering cybernetics and artificial intelligence (AI), Disruptive Technologies - Frugal Innovations - Emerging Technologies- Autonomous Robots, Swam Robot, Modular Robotics, Space craft, Intellectual Property Rights (IPR): Case Studies.

UNIT 5 SMART WORLD**8 Hrs.**

Smart Sensors and IIOT, Smart grid, Hybrid renewable energy systems, Electronics in Smart city, Integration of Sensors in Robots and Artificial Intelligence, 5G Technology, Communication protocols, Human-Machine Interaction, Virtual Reality, Quantum Computing: Changing trends in transistor technology: Processor, Emerging Trends: Deep Space, Swarm Robots, Cyborg, Geofencing, Pervasive Computing, Intellectual Property Rights- Case Studies.

UNIT 6 CYBER PHYSICAL SYSTEMS**8 Hrs.**

Introduction to Cyber Physical Systems (CPS), Architecture of CPS, Data science and technology forCPS, Prototypes of CPS, Emerging applications in CPS including social space, crowd sourcing, healthcare and human computer interactions, Industrial Artificial Intelligence, Deep Learning, Gamification, Networking systems for CPS applications, Wearable cyber physical systems and applications, Domain applications of CPS: Agriculture, Infrastructure, Disaster management, Energy, Transportation, Intellectual Property Rights (IPR) : Case Studies.

Max. 45 Hrs.**COURSE OUTCOMES**

On completion of the course, student will be able to

- CO1 - Apply the basic concepts for electro optical sensing technology and selection of materials.
- CO2 - Analyze the technology on AI and Big Data for biomedical applications.
- CO3 - Elaborate the various technologies for sustainable built environment.
- CO4 - Evaluate different smart manufacturing technologies for industrial robotics-based automation.
- CO5 - Compare various advanced technologies for development of smart city..
- CO6 - Build Cyber physical systems using AI for Industry, Agriculture and disaster management applications.

TEXT / REFERENCE BOOKS

1. William D. Callister, "Materials Science and Engineering, An Introduction", John Willey and Sons Inc. Singapore, 2001.
2. V. Raghavan, "Physical Metallurgy: Principle and Practice", Prentice Hall India Pvt Ltd., 2006.
3. FlavioCraveiro, Jose Pinto Duarte, Helena Bartolo and Paulo JorgeBartolo, "Additive manufacturing as an enabling technology for digital construction: A perspective on Construction 4.0", Automation in Construction, Vol. 103, 2019.
3. Klaus Schwab, "Fourth Industrial Revolution", Random House USA Inc, New York, USA, 2017.