SCHOOLOFBUILDING ANDENVIRONMENT

DEPARTMENTOFCIVILENGINEERING

BOARDOFSTUDIESMEETING - Academic year 2020-2021

The periodic Board of studies meeting -Virtual, for the Department of Civil Engineering, School ofBuilding and Environment willbeheldon30.06.2020at4.00pm

Internalmembers

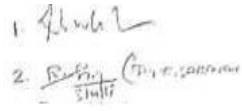
1. Dr.DevyaniGangopadhyay,Dean,SchoolofBuildingandEnvironment
2. Dr.S.Packialakshmi,AssociateProfessor,DepartmentofCivilEngineering
3. Dr.R.Padmapriya,AssociateProfessor,DepartmentofCivilEngineering
4. Dr.V.Sampathkumar,Professor,DepartmentofCivilEngineering
5. Dr.S.Nandhakumar,AssistantProfessor,DepartmentofCivilEngineering

Externalmembers

1. Dr.R.Santhakumar,Professor,DepartmentofCivilEngineering,NITTTR,Chennai
2. Dr.R.Saravanan,AssociateProfessor,CWR,AnnaUniversity,Chennai

Agenda:

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



Convenor/Dean **HOD** **Expertmember**

SCHOOLOFBUILDING ANDENVIRONMENT

DEPARTMENTOFCIVILENGINEERING

MinutesoftheBOSMeeting-Academic year 2020-2021

The BoardofStudiesMeeting - Virtual for both UG and PG programme is heldon30th June,2020at 4.00pm.

MembersPresent

1. Dr.DevyaniGangopadhyay — Convenor
   Dean,SchoolofBuildingandEnvironment
2. Dr.R.Santhakumar — ExpertMember
   Professor,DepartmentofCivilEngineering,NITTTR,Chennai
3. Dr.R..Saravanan — ExpertMember
   AssociateProfessor,CWR,AnnaUniversity,Chennai
4. Dr.R.Padmapriya — Member
   AssociateProfessor,DepartmentofCivilEngineering
5. Dr.S.Packialakshmi, — Member
   AssociateProfessor,DepartmentofCivilEngineering
6. Dr.V.Sampathkumar, — Member
   Professor, DepartmentofCivilEngineering
7. Dr.S.Nandhakumar — Member
   Assistant Professor, Department ofCivilEngineering

After a brief introduction, the agenda were taken up for discussion and as per the constructive suggestions given by Dr. R.Santhakumar,Professor,DepartmentofCivilEngineering,NITTTR,Chennai and Dr.R.Saravanan,AssociateProfessor,CWR,AnnaUniversity,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 intheIndustry4.0willbe helpfulforthe studentstoindustryreadywithintheircourse period
- Thelongdurationofinternshiptrainingmaybeincludedinprogramcurriculumtoexpandthekno wledgeonrealtimeindustrialprojectstothestudents.
- Thestudentsmustacquireknowledgeonskilldevelopmentcoursesinrelationwithindustryanda dditionalcreditscanalsobegivenforthesame.

Convenor/Dean	HOD	Expertmember

SAIC4001	INDUSTRY4.0	L	T	P	Credits	TotalMarks
		2	0	2	2	100

UNIT1 ADVANCEDTECHNOLOGYANDADVANCEDMATERIALS 7Hrs.

Advanced electro-optical sensing technology-active, passive multi-spectral and hyper spectral imaging; electronic beamsteering; vacuum technology, surfaceandcoatingtechnology,health care technology,Nanotechnology-Nanomechanics,Nanooptoelectronics;energystoragetechnology-nextgenerationLi-basedBatteries,Hydrogenstorage,solarphotovoltaic's,Flexibleelectronics.IntellectualPropertyRights-casestudiesgoverning/pertainingtoMaterials/Technology.

UNIT2 TRANSFORMINGTECHNOLOGIESINBIOENGINEERING 7Hrs.

Establishment of smart biotechnology factory, Artificial intelligence in Bioprocess technology, Omics - Big data analysisthrough automation, 3D bio printing for tissue engineering.Simulation tools,RSM andBox model. Cyber physical systembased telemedicine, diagnosis and therapeutics through real time biosensors. Bionanotechnology. Intellectual Propertyrights(IPR):CaseStudies.

UNIT3 ADVANCEMENTSINSUSTAINABLEBUILTENVIRONMENT 7Hrs.

Introduction - Technological developments in Architectural, Engineering and Construction (AEC) - Building InformationModelling (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 gradedstructures - Net Zero Energy buildings, Bioswales, Biofiltration pond, Ecosan systems- Recent developments in Wastewater Management, Air pollution control, waste disposal - Integration of energy, water and environmental systems for asustainable development- Emerging Technologies: Robot Highway- Vertical farming - Intellectual Property rights: Casestudies.

UNIT4 SMARTMANUFACTURING 8Hrs.

Smart factories and interconnection, Smart Manufacturing - automation systems, Additive Manufacturing, Smart grids,MicroElectroMechanicalSystems (MEMS),Stealth technology,Metal Finishing,Self-propelled vehicles,emobility, Greenfuels,drones-unmannedaerialvehicles(UAVs),aerodynamics.RoboticAutomationandCollaborativeRobots-

Augmented reality and haptics, engineering cybernetics and artificial intelligence (AI), Disruptive Technologies - FrugalInnovations -Emerging Technologies- Autonomous Robots, Swam Robot, Modular Robotics, Space craft, IntellectualPropertyRights(IPR):CaseStudies.

UNIT5 SMARTWORLD 8Hrs.

Smart Sensors and IIOT, Smart grid, Hybrid renewable energy systems, Electronics in Smart city, Integration of Sensors inRobots 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,PervasiveComputing,IntellectualPropertyRights-CaseStudies.

UNIT6 CYBERPHYSICALSYSTEMS 8Hrs.

IntroductiontoCyberPhysicalSystems(CPS),Architecture ofCPS,Data scienceand technology forCPS,Prototypes ofCPS, 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 cyberphysical systems and applications, Domain applications of CPS: Agriculture, Infrastructure, Disaster management, Energy,Transportation,IntellectualPropertyRights(IPR):CaseStudies.

Max.45Hrs.

COURSEOUTCOMES

Oncompletionofthecourse,studentwillbeableto

CO1-Applythebasicconceptsforelectroopticalsensingtechnologyandselectionofmaterials.

CO2-AnalyzethetechnologyonAIandBigDataforbiomedicalapplications.CO3-Elaboratethevarioustechnologiesforsustainablebuiltenvironment..

CO4-Evaluatedifferentsmartmanufacturingtechnologiesforindustrialrobotics-basedautomation.

CO5-Comparevariousadvancedtechnologiesfordevelopmentofsmartcity..

CO6-BuildCyberphysicalsystemsusingAIforIndustry,Agricultureanddisastermanagementapplications.

TEXT/REFERENCEBOOKS

1. WilliamD.Callister,"MaterialsScienceandEngineering,AnIntroduction",JohnWilleyandSonsInc.Singapore,2001.
2. V.Raghavan,"PhysicalMetallurgy:PrincipleandPractice",PrenticeHallIndiaPvtLtd.,2006.
3. FlavioCraveiro, Jose Pinto Duarte, Helena Bartolo and Paulo JorgeBartolo,"Additive manufacturing as an enablingtechnologyfordigitalconstruction:AperspectiveonConstruction4.0",AutomationinConstruction,Vol.103,2019.
3. KlausSchwab,"FourthIndustrialRevolution",RandomHouseUSAInc,NewYork,USA,2017.

SCHOOLOFBUILDING ANDENVIRONMENT

DEPARTMENTOFCIVILENGINEERING

BOARDOFSTUDIESMEETING - Academic year 2020-2021

The periodic Board of studies meeting - Virtual, for the Department of Civil Engineering, School ofBuilding and Environment willbeheldon01.02.2021at11.00am

Internalmembers

1. Dr.DevyaniGangopadhyay,Dean,SchoolofBuildingandEnvironment
2. Dr.S.Packialakshmi,AssociateProfessor,DepartmentofCivilEngineering
3. Dr.R.Padmapriya,AssociateProfessor,DepartmentofCivilEngineering
4. Dr.V.Sampathkumar,Professor,DepartmentofCivilEngineering
5. Dr.S.Nandhakumar,AssistantProfessor,DepartmentofCivilEngineering

Externalmembers

1. Dr.R.Santhakumar,Professor,DepartmentofCivilEngineering,NITTTR,Chennai
2. Dr.R.Saravanan,AssociateProfessor,CWR,AnnaUniversity,Chennai

Agenda:

1. Review of Curriculum for the upcoming semester courses
2. ImplementationofPublicHealthEngineeringasChoice Based Credit SystemCourseallbranchesofUGProgramme

(S. PACKIALAKSHMI)

Convenor/Dean **HOD** **Expertmember**

SCHOOLOFBUILDING ANDENVIRONMENT

DEPARTMENTOFCIVILENGINEERING

MinutesoftheBOSMeeting-Academic year 2020-2021

The BoardofStudiesMeeting - Virtual for both UG and PG programme is heldon1st Febraury,2021at 11.00AM.

MembersPresent

1. Dr.DevyaniGangopadhyay — Convenor
   Dean,SchoolofBuildingandEnvironment
2. Dr.R.Santhakumar — ExpertMember
   Professor,DepartmentofCivilEngineering,NITTTR,Chennai
3. Dr.R..Saravanan — ExpertMember
   AssociateProfessor,CWR,AnnaUniversity,Chennai
4. Dr.R.Padmapriya — Member
   AssociateProfessor,DepartmentofCivilEngineering
5. Dr.S.Packialakshmi, — Member
   AssociateProfessor,DepartmentofCivilEngineering
6. Dr.V.Sampathkumar, — Member
   Professor, DepartmentofCivilEngineering
7. Dr.S.Nandhakumar — Member
   Assistant Professor, Department ofCivilEngineering

After a brief introduction, the agenda were taken up for discussion and as per the constructive suggestions given by Dr. R.Santhakumar,Professor,DepartmentofCivilEngineering,NITTTR,Chennai and Dr.R.Saravanan,AssociateProfessor,CWR,AnnaUniversity,Chennai, the following discussions were taken up into considerations;

- ThesyllabusforthePublicHealthEngineeringforall UGProgrammes was approved by Expert Committee members and implemented as CBCS for the academic year2020-2021
- The Curriculum for the courses (both Undergraduate and Post Graduate) in the upcoming semester is meeting out the requirements of skill development / Employability / Entrepreneurship liability for the students.

(S. PACKIALAKSHMI)

Convenor/Dean **HOD** **Expertmember**

SCIA4002	PUBLICHEALTHENGINEERING	L	T	P	Credits	TotalMarks
		2	0	0	2	100

COURSEOBJECTIVES

- Toprovideknowledgeaboutthesolidwastemanagementanditsdisposal.
- Toimplicatetheimportanceofwastewatertreatment.
- TocreateawarenessandimportanceoftheRainwaterHarvestingandArtificialRechargeTechniques.
- Toprovideanawarenessaboutthehealthimpactsduetowater,airandlandpollution.
- Togainknowledgeonvariousregulatorybodiesandacts.

UNIT–I–SOLID WASTEMANAGEMENT

Importance of public health engineering - Role of public health engineer - Sources and types of solid wastes - Waste generationrates and variation-Components ofIntegratedSWM-SustainableSWMtechniquesat source-Segregation and sorting, reduce,reuse, and recycle. Present scenario of SWM in Urban Local Bodies - Dumping of solid waste- sanitary landfills- waste disposaloptions-Casestudiesrelatedtoreuseofwaste.

UNIT –II–WASTEWATERMANAGEMENT

Sewage - classification - Waste water treatment - primary, secondary and tertiary stages - Standards for Disposal - Methods - Self-purification of river- Oxygen sag curve - Land disposal - Sewage farming - Objectives - Sludge characterization - Thickening - Designofgravitythickener-Sludgedigestion-SludgeConditioningandDewatering-Sludgedryingbeds-ultimateresiduedisposal -recentadvances-Casestudiesrelatedtowastewaterreclamation.

UNIT–III –WATERQUALITY MANAGEMENT

RoleofEnvironmentalEngineer-Watersupply-developmentofpublicwatersupply-needforprotectedwatersupplies-objectivesofwatersupplysystems--Qualityofwater-physical,chemicalandbiologicalaspects-analysisofwater-waterqualitystandards -SustainableDevelopment-RainwaterHarvesting-ArtificialRechargeTechniques-Casestudiesrelatedtowatermanagement.

UNIT–IV–HEALTHIMPACTS

Health and environmental effects of water, air and land pollution - Chemicals in drinking water - Sources of air pollution - Sourcesoflandpollutants- Disease-Preventive measures- Casestudiesrelated topollutioneffects.

UNIT–V–GUIDELINESFORWATERACT&AIRACT

Roleofregulatorybodies&Localbodies-CPCB-TWADBoard-CMWSSBetc-CaseStudiesrelatedtoEffectiveWaterManagement - National concern for environment: Important environmental protection acts in India - water, air (prevention andcontrolofpollution)act.

COURSEOUTCOMES:

Oncompletionofthecourse,studentwillbeableto

CO1-Understandthesegregationand3Rfromthesolidwaste.

CO2-Performbasic designoftheunitoperations and processesthat are usedinsewagetreatment.CO3-

Analysisofwaterqualitycriteriaand standardsandtheirrelationtopublichealth.

CO4-Studyonhealthimpactsanditspreventivemeasures.

CO5-Understandaboutthevariousboardsforwaterandairacts.

CO6-Understandthepreventionandcontrolofwaterandairpollutionacts.

TEXT/ REFERENCESBOOKS:

1. Khan,I.H.,&Ahsan,N. (2019).Textbook ofsolidwastemanagement.NewDelhi:SatishKumar JainforCBSPublisherandDistributors.
2. MantellC.L.,(1975),"SolidWasteManagement",JohnWiley.
3. "WastewaterEngineering- Treatment andReuse", Metcalf andEddy Inc., (2012),4thEdition, TataMcGrawHillPublishingCo.Ltd.,NewDelhi.
4. ViessmanJr,HammerJ.M,Perez,E.M,andChadik,P.A,WaterSupplyandPollutionControl,PHILearning,NewDelhi,2009
5. CPHEEO(2016).ManualonMunicipalSolidWasteManagement,CentralPublicHealthandEnvironmentalEngineering Organisation,MinistryofUrbanDevelopment,Govt.ofIndia,NewDelhi.