



आपदा न्यूनीकरण एवं प्रबन्धन उत्कृष्टता केन्द्र, भारतीय प्रौद्योगिकी संस्थान रुड़की,

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CENTRE OF EXCELLENCE IN DISASTER MITIGATION & MANAGEMENT, 3<sup>rd</sup> Floor,  
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1. Subject Code : **DMN-602** Course Title: **Climate Change and Sustainable Development**
2. Contact Hours: **L: 3 T: 1 P: 0**
3. Examination Duration (Hrs.) : **Theory: 3 Practical: 0**
4. Relative Weight : **CWS 25 PRS 0 MTE 25 ETE 50 PRE 0**
5. Credits: **4** 6. Semester: **Autumn** 7. Subject Area: **PCC**
8. Pre-requisite: **Nil**
9. Objective: To impart knowledge on climate change and sustainable development
10. Details of Course:

S. No.	Contents	Contact Hours
1.	<b>Introduction:</b> Macro-, meso-and microclimate; Population and development; Sustainability and its various dimensions (economic, social and ecological); Sustainable Development; Global Warming and Climate Change	<b>6</b>
2.	<b>Sustainable Development :</b> Energy, Earth/Soil , Materials – production and use, Water, Quality of indoor/outdoor environment, Site, transport, urban density and infrastructure – waste and water management, food procurement, farming	<b>8</b>
3.	<b>Urban climate system:</b> Ecosystem-atmosphere interactions: underlying principles and measurement (carbon, water, energy, trace-gasses; Energy balances, conduction, convection, radiation, evapo-transpiration, anthropogenic heat production; Urban boundary layer, urban canopy layer; Layer of inversion; Urban roughness and winds, Aerosols and their effect on cloud and precipitation; Urban water balance, Air pollution; Ground level ozone, increased energy demand; Urban Canyon, UHI	<b>10</b>
4.	<b>Urban Environmental Policies:</b> Principles of Sustainable Development, policies and regulations, The Stockholm Convention on Persistent Organic Pollutants, Montreal Protocol, Rotterdam Convention, Long-range Transboundary Air Pollution convention, Kyoto Protocol, Climate Policy- IPCC	<b>6</b>
5.	<b>Adaptation and Mitigation:</b> Conservation and preservation, Adaptation and Mitigation; Urban green infrastructure, green roof, green alleys; Urban forestry; rainwater harvesting, etc.	<b>8</b>
6.	<b>Application potential of simulation software:</b> Simulation tools for assessment of environmental performance ENVI-met, Rayman, IES VE-Pro, etc.;	<b>4</b>
	<b>Total</b>	<b>42</b>

11. Suggested Books:

S. No.	Name of Authors/Books/Publishers	Year of Publication/ Reprint
1.	Oke, T.R., 1987, <i>Boundary Layer Climates</i> , Routledge, London	1987
2.	Bonan, G., 2002, <i>Ecological Climatology</i> , Cambridge University Press	2002
3.	Ari Miesel, LEED Materials: A Resource Guide to Green Building, Princeton Architectural Press	2010
4.	Deb, S., 'Environmental Management', Jaico Publishing House	2003
5.	Speth, J.G., "The Bridge at the Edge of the World: Capitalism, the Environment, and Crossing from Crisis to Sustainability", Yale University Press	2008