<table>
<tr><td>Course title</td><td colspan="9">Sustainability in River Basin Management</td><td>Course No</td><td colspan="4">CE5016</td></tr>
<tr><td rowspan="2">Department</td><td rowspan="2">Civil Engineering</td><td>New</td><td>L</td><td>T</td><td>E</td><td>P</td><td>O</td><td>C</td><td>TH</td><td>Old</td><td>L</td><td>T</td><td>P</td><td>C</td></tr>
<tr><td>Credits</td><td>3</td><td></td><td></td><td></td><td>6</td><td>9</td><td></td><td>Credits</td><td>3</td><td></td><td></td><td>3</td></tr>
<tr><td>Offered for</td><td colspan="9">Ph.D.; M.S.; M. Tech.; B. Tech. 4th year</td><td>Status</td><td colspan="4">Modified</td></tr>
<tr><td>Faculty</td><td colspan="9">B. S. Murty; Balaji Narasimhan; Venkatraman Srinivasan; K. P. Sudheer</td><td>Type</td><td colspan="4">Theory</td></tr>
<tr><td>Pre-requisite</td><td colspan="9">None</td><td>To take effect from</td><td colspan="4">01-01-2022</td></tr>
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**Objectives:**

At the end of the course, the students

1) have a clear understanding of concepts of sustainability, sustainability indices and need for sustainable development;

2) are capable of applying principles of sustainability for holistic water management at the scale of river basins;

3) are capable of assessing river basin scale water management plans from the point of view of sustainability.

**Course Contents:**

1. Introduction: Basic concepts of sustainability; Anthropocene; Global climate change

2. Basic hydrologic processes: Precipitation, Interception, Evapotranspiration, Water in vadose zone, Groundwater, Surface runoff and Streamflow

3. Status and challenges in sustainability and river basin management: Rising water demand; Water and poverty; Water governance and finance; Water pollution; Water and land use; Dams and diversions, Blue and green water, Hydrological change due to climate change.

4. Towards sustainability: Optimizing and improving single aspects; Demand reduction; Increasing supplies; Water resources protection; Equity and education; Monitoring and data management; Improving management and justice; Improving administrative (transnational) structures; Improving prediction and risk assessment.

5. Evaluation of sustainability: Economic and sustainability criteria; Ecological and environment sustainability criteria; Institutional and social sustainability criteria; Multi-criteria sustainability indices, Complex decision support systems

**Text Books:**

1. Jones, J. A. A. 2010. Water sustainability - a global perspective. Hodder Education: London.

2. Loucks,D.P.; Gladwell,J.S.1999. Sustainability criteria for water resource systems. Cambridge University Press: Cambridge.

3. S. L. Dingman, 2002, Physical hydrology, Prentice-Hall.

**Reference Books:**

Selection of recent and fundamental journal articles (available as pdf) as suggested by the Instructor