Course Title: Justice in Engineering

Course Description:
This course explores the ethical, social, and environmental implications of engineering practices, emphasizing the role of justice, fairness, and responsibility in engineering design and decision-making. Students will gain an understanding of how engineering impacts society and the environment, and develop strategies for creating more equitable and sustainable solutions.

Course Objectives:
Upon completion of this course, students will be able to:

- Understand the ethical principles and frameworks relevant to engineering practice.
- Evaluate the social and environmental implications of engineering decisions.
- Apply principles of justice and fairness to engineering design and decision-making.
- Develop strategies for addressing biases and promoting diversity, equity, and inclusion in the engineering profession.
- Engage in critical reflection on personal values and responsibilities as engineers.

Course Outline:

Week 1: Introduction to Ethics and Justice in Engineering

- Engineering ethics: principles and codes of conduct
- The role of engineers in society
- Introduction to justice, fairness, and equity
- Historical case studies on engineering and social responsibility

Week 2: Ethical Frameworks for Engineering Practice

- Utilitarianism, deontology, and virtue ethics
- Rights-based and duty-based ethics
- Ethical decision-making in engineering
- Case studies: ethical dilemmas in engineering

Week 3: Social and Environmental Implications of Engineering

- Engineering, society, and the environment: interconnections and impacts
- Environmental justice and sustainability

- Social implications of technology development
- Case studies: engineering projects with significant social and environmental consequences

Week 4: Engineering for Social Justice

- Inclusive design and universal accessibility
- Participatory design and community engagement
- Human-centered design and needs assessment
- Case studies: engineering projects promoting social justice

Week 5: Diversity, Equity, and Inclusion in Engineering

- Identifying and addressing biases in engineering
- Promoting diversity in the engineering workforce
- Creating inclusive work environments and teams
- Case studies: diversity, equity, and inclusion initiatives in engineering organizations

Week 6: Global Engineering and Cultural Competence

- Engineering in a global context
- Cultural competence and sensitivity in engineering
- Ethical considerations in international engineering projects
- Case studies: cross-cultural engineering challenges and solutions

Week 7: Engineering, Policy, and Advocacy

- The role of engineers in public policy
- Engineering, regulation, and safety
- Advocating for responsible engineering practices
- Case studies: engineering policy and advocacy initiatives

Week 8: Reflection and Future Directions

- Personal values and responsibilities as engineers
- Strategies for ethical leadership in engineering
- Integrating justice and ethics into engineering practice
- Developing a personal action plan for promoting justice in engineering

Assessment Methods:

Class participation and discussion (20%)
Case study analysis assignments (40%)
Final project: Personal action plan for promoting justice in engineering (40%)