**E.G.S.PILLAY ENGINEERING COLLEGE - NAGAPATTINAM**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**COURSE CODE**: GE2025

**COURSE TITLE**: PROFESSIONAL ETHICS IN ENGINEERING

**COURSE PLAN**

**SEMESTER**: 06 **COURSE DURATION**: January – April’2016

**YEAR & CLASS**: IV year VIII Semester IT **LOCATION:** GG BLOCK – First Floor

**FACULTY DETAILS**:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S.No** | **Name** | **Designation** | **Dept.** | **Mail ID** | **Website** | **Mobile No.** |
| 1. | M. Chinnadurai | Associate Professor | IT | mchinna81@gmail.com | http://www.sites.google.com/site/mchinna | 9965528581 |

**TEXT BOOKS**

1. Kevin Night and Elaine Rich, Nair B., “Artificial Intelligence (SIE)”, McGraw Hill- 2008. (Unit-1,2,4,5).

2. Dan W. Patterson, “Introduction to AI and ES”, Pearson Education, 2007. (Unit-III)

**REFERENCES:**

1. Peter Jackson, “Introduction to Expert Systems”, 3rd Edition, Pearson Education, 2007.

2. Stuart Russel and Peter Norvig “AI – A Modern Approach”, 2nd Edition, Pearson Education 2007.

3. Deepak Khemani “Artificial Intelligence”, Tata Mc Graw Hill Education 2013.

4. http://nptel.ac.in

**Resource:**

1. *http://* www.w3schools.com
2. *http://* google.com
3. *http://* www.itebooks.org
4. *http://* sites.google.com/site/mchinna

**Aim**

The aim of the course is to make the students to understand the basic concepts and use of professional ethics in engineering environment.

**Course Objectives & Outcomes**

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| **Course Objectives** | **Course Outcomes** |
| 1. To enable the students to create an awareness on Engineering Ethics 2. To instill Moral and Social Values and Loyalty 3. To appreciate the rights of others and aware of global issues. | At the end of this course, the students will be able to,  CO1. Apply ethics in society  CO2. Discuss the ethical issues related to engineering  CO3. Perform assessment and analysis safety and risk  CO4. Realize the responsibilities and rights in the society  CO5. Discuss about various global issues |

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| **CS6659 – ARTIFICIAL INTELLIGENCE** | | | | |
| Course designed by | Anna University, Chennai | | | |
| Category | GENERAL (G) | BASIC  SCIENCES (B) | ENGINEERING SCIENCES  AND TECHNICAL ART (E) | PROFESSIONAL  SUBJECTS (P) |
| X |  |  |  |
| Course coordinator | M. Chinnadurai, Associate.Prof/IT | | | |

**Direct Assessment Details**

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| **Name of Assessment** | **Internal Marks** | **Topics** | **Duration** |
| Unit Test | 20 | Unit I | 2 Periods |
| Cycle Test -1 | II & III Units | 3 Hrs |
| Cycle Test -2 | I, IV & V Units | 3 Hrs |
| Model Exam | Entire Syllabus | 3 Hrs |
| Assignments | -- | Entire Syllabus | -- |
| Innovative Assignment | Content Beyond Syllabus | -- |
| Total | 20 |  |  |

**DETAILED SESSION PLAN**

**UNIT I : Engineering Ethics**

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| **Session No** | | **Topics to be covered** | **Instructional Delivery** | | | | **Assessment**  **Method** | **Course**  **Objective** | **Course**  **Outcome** |
| **Method** | **Teaching Aids** | | **Level** |
| |  |  |  | | --- | --- | --- | | **LECTURE** | **TUTORIAL** | **PRACTICAL** | | **9 Hrs.** | **0 Hr** | **0 Hr** |   Senses of 'Engineering Ethics' - Variety of moral issues - Types of inquiry - Moral dilemmas - Moral Autonomy - Kohlberg's theory - Gilligan's theory - Consensus and Controversy - Professions and Professionalism - Professional Ideals and Virtues - Uses of Ethical Theories | | | | | | | | | |
| 1 | Senses of 'Engineering Ethics, Variety of moral issues | | Lecture with discussion | Chalk and Board, Power Point Presentation and Video Animation | Understand | | Tests, Assignments | 1. To enable the students to create an awareness on Engineering Ethics 2. To instill Moral and Social Values and Loyalty | CO1. Apply ethics in society  CO2. Discuss the ethical issues related to engineering |
| 2 | Types of inquiry | |
| 3,4 | Moral dilemmas, Moral Autonomy | |
| 5 | Kohlberg's theory | |
| 6 | Gilligan's theory | |
| 7 | Consensus and Controversy | |
| 8 | Professions and Professionalism | |
| 9 | Professional Ideals and Virtues , Uses of Ethical Theories | |
| **CUMULATIVE HOURS = LECTURE: 9 Hrs, TUTORIAL : -** | | | | | | | | | |

**UNIT II Engineering as Social Experimentation**

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| **Session No** | | **Topics to be covered** | **Instructional Delivery** | | | | **Assessment**  **method** | **Instructional Objective** | **Instructional**  **Outcome** |
| **Method** | **Teaching Aids** | | **Level** |
| |  |  |  | | --- | --- | --- | | **LECTURE** | **TUTORIAL** | **PRACTICAL** | | **9 Hrs.** | **0 Hr** | **0 Hr** |   Engineering as Experimentation - Engineers as responsible Experimenters - Research Ethics -Codes of Ethics - Industrial Standards - A Balanced Outlook on Law - The Challenger Case Study | | | | | | | | | |
| 10 | Engineering as Experimentation | | Lecture with Discussion | | Chalk and Board, Power Point Presentation and Video Animation | Understand | Tests,  Assignments | 1. To instill Moral and Social Values and Loyalty | CO1. Apply ethics in society  CO2. Discuss the ethical issues related to engineering |
| 11 | Engineers as responsible Experimenters | |
| 12 | Research Ethics | |
| 13,14 | Codes of Ethics | |
| 15,16 | Industrial Standards ,A Balanced Outlook on Law | |
| 17,18 | The Challenger Case Study | |
| **CUMULATIVE HOURS = LECTURE: 18 Hrs, TUTORIAL : -** | | | | | | | | | |

**UNIT III:** Engineer's Responsibility for Safety

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| **Session NO** | **Topics to be covered** | **Instructional Delivery** | | | **Assessment**  **method** | **Course**  **objective** | **Course**  **outcome** |
| **Method** | **Tool** | **Level** |
| |  |  |  | | --- | --- | --- | | **LECTURE** | **TUTORIAL** | **PRACTICAL** | | **9 Hrs.** | **0 Hr** | **0 Hr** |   Safety and Risk - Assessment of Safety and Risk - Risk Benefit Analysis - Reducing Risk - TheGovernment Regulator's Approach to Risk - Chernobyl Case Studies and Bhopal | | | | | | | |
| 19 | Safety and Risk | Lecture with Discussion | Chalk and Board, Power Point Presentation and Video Animation | Understand | Tests,  Assignments | 1. To instill Moral and Social Values and Loyalty | CO3. Perform assessment and analysis safety and risk | |
| 20 | Assessment of Safety and Risk |
| 21 | Risk Benefit Analysis |
| 22,23 | Reducing Risk |
| 24,25 | Chernobyl Case Studies |
| 26,27 | Bhopal Case Studies |
| **CUMULATIVE HOURS = LECTURE: 27 Hrs, TUTORIAL : -** | | | | | | | | |

**Unit IV:** Responsibilities and Rights

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| **Session No** | | **Topics to be covered** | **Instructional Delivery** | | | **Assessment**  **method** | **Instructional Objective** | **Instructional**  **Outcome** |
| **Method** | **Teaching Aids** | **Level** |
| |  |  |  | | --- | --- | --- | | **LECTURE** | **TUTORIAL** | **PRACTICAL** | | **9 Hrs.** | **0 Hr** | **0 Hr** |   Collegiality and Loyalty - Respect for Authority - Collective Bargaining - Confidentiality - Conflicts of Interest - Occupational Crime - Professional Rights - Employee Rights - Intellectual Property Rights (IPR) – Discrimination. | | | | | | | | |
| 28 | Collegiality and Loyalty | | Lecture with Discussion | Chalk and Board Power Point Presentation and | Understand | Tests,  Assignments, | 1. To appreciate the rights of others and aware of global issues. | CO4. Realize the responsibilities and rights in the society |
| 29 | Respect for Authority | |
| 30,31 | Collective Bargaining, Confidentiality | |
| 32 | Conflicts of Interest | |
| 33 | Occupational Crime | |
| 34 | Professional Right, Employee Rights | |
| 35,36 | Intellectual Property Rights (IPR) ,Discrimination | |
| **CUMULATIVE HOURS = LECTURE: 36 Hrs, TUTORIAL : -** | | | | | | | | |

**Unit V: Global Issues**

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| **Session No** | | **Topics to be covered** | **Instructional Delivery** | | | **Assessment**  **method** | **Course objective** | **Course outcome** |
| **Method** | **Tool** | **Level** |
| |  |  |  | | --- | --- | --- | | **LECTURE** | **TUTORIAL** | **PRACTICAL** | | **9 Hrs.** | **0 Hr** | **0 Hr** |   Multinational Corporations - Business Ethics - Environmental Ethics - Computer Ethics - Role in Technological Development - Weapons Development - Engineers as Managers - Consulting Engineers - Engineers as Expert Witnesses and Advisors - Honesty - Moral Leadership - Sample Code of Conduct | | | | | | | | |
| 37 | Multinational Corporations, Business Ethics | | Lecture with Discussion | Chalk and Board, Power Point Presentation | Understand | Tests,  Assignments | 1. To appreciate the rights of others and aware of global issues. | CO5. Discuss about various global issues |
| 38 | Environmental Ethics | |
| 39,40 | Computer Ethics, Role in Technological Development | |
| 41,42 | Weapons Development, Engineers as Managers, Consulting Engineers | |
| 43 | as Expert Witnesses and Advisors, Honesty | |
| 44,45 | Moral Leadership, Sample Code of Conduct | |  |  |  |  |
| **CUMULATIVE HOURS = LECTURE: 45 Hrs, TUTORIAL : -** | | | | | | | | |

**Mapping Table:**

**Course Outcomes vs POs**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sl.**  **No.** | **Course Outcome** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| 1 | CO1 |  | 3 | 3 | 3 |  | 3 |  | 3 |  |  | 3 |  |
| 2 | CO2 | 3 | 3 | 3 | 3 |  | 3 | 3 | 2 | 2 |  |  |  |
| 3 | CO3 | 2 | 3 |  | 2 | 3 | 2 | 3 |  |  |  | 3 | 3 |
| 4 | CO4 |  |  |  |  |  | 3 | 2 | 3 | 3 |  | 3 |  |
| 5 | CO5 | 2 |  |  | 3 |  | 3 | 3 | 3 |  |  | 2 |  |

**Course Outcomes vs PSOs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl.**  **No.** | **Course Outcome** | **PSO1** | **PSO2** | **PSO3** |
| 1 | CO1 | 2 |  | 2 |
| 2 | CO2 | 2 |  | 2 |
| 3 | CO3 | 2 | 2 | 2 |
| 4 | CO4 | 3 |  | 3 |
| 5 | CO5 | 2 | 2 | 2 |

**Course Incharge HOD**