| | |
|---|---|
| Course Code | TKEE165224 |
| Course Name | Neurofuzzy Control Technique |
| Course Instructors | Oyas Wahyunggoro; Indah Soesanti; Risanuri Hidayat; Litasari; |
| Course Type | Elective |
| Course Classification | Engineering Topics |
| Credit / Contact Hour per Week | 3 / 150 minutes per Week |
| Course Description | The Neurofuzzy Control Technique course learns intelligent control techniques that are optimized using neurofuzzy. Non-derivative algorithms such as genetic algorithms are also discussed here. Similarly, system identification techniques |
| Prerequisites Courses | - |
| **Covered Student Outcome** | **Development of Engineering Solution (b)**<br>**Engineering Design (c)** |

| | |
|---|---|
| Learning Outcome | 1. Students are able to describe the background of the neurofuzzy control technique, distinguishing the conventional control technique from the neurofuzzy control technique.2. re-explain Fuzzy Logic concepts<br>2. Students are able to describe the basic concept of artificial neural network and its applications in the direct and indirect control<br>3. Students are able to explain and make illustrations of some ANN applications in fuzzy control, neurofuzzy control, and especially ANFIS<br>4. Students are able to explain the effect of controller to the steady state characteristic, and the stability criterion of control system.<br>5. Students are able to designcontrol system using conventional method, neurofuzzy, and fuzzy supervisory control system.<br>6. Students are able to identify systems using genetic algorithms, understand the principles of identification and fuzzy estimation, and the principle of adaptive fuzzy control |
| Topic | 1. Overview of Fuzzy Logic<br>2. Fuzzy Mathematics<br>3. Fuzzy Logic Design<br>4. ANN<br>5. Neurofuzzy and ANFIS<br>6. Overview of Control System<br>7. Control System Characteristics<br>8. Control System Stability<br>9. Design of Neorufuzzy Control System<br>10. System Identification |
| Direct Asessment | **Direct Asessment Plan** / **Measured Learning Outcome**<br>Assignment / LO1-6<br>Mid Exam / LO1,LO2,LO3<br>Final Exam / LO4,LO5,LO6 |
| Indirect Assesment | Questionnaire (EDOM) |
| References | [1] N.S. Nise, Control System Engineering, Hoboken, NJ: John Wiley & Sons Ltd., 2004.<br>[2] J. Jacob, Industrial Control Electronics, Englewood Cliffs, NJ.: Prentice-Hall International Editions, 1989.<br>[3] M. Jamshidi and M. Zavarei, Linear Control Systems : A Computer-Aided Approach., Great Britain: Wheaton & Co.Ltd., 1986.<br>[4] L. Wang, A Course in Fuzzy System and Control, Upper Saddle River, New Jersey 07458: Prentice-Hall, Inc, A Division of Simon and Schuster, 1997.<br>[5] K. Man, S. Tang, and W. Halang, Genetic Algorithms for Control and |

Signal Processing, Britain: Springer-Verlag London Limited, 1997.
[6] Hung T. Nguyen, Nadipuram R. Prasad, Carol L. Walker , Elbert A. WalkerA First Course In Fuzzy and Neural Control, Chapman & Hall/CRC, 2003.
[7] Passino, KM and Yurkovich, S. Fuzzy Control. Addison Wesley Longman, Inc. Californio 94025. 1998.