MODULE HANDBOOK DESCRIPTION

Module designation	Supervisory Control and Data Acquisition (SCADA)
Code	FBA0011
Semester(s) in which the module is taught	7/fourth year
Person responsible for the module	Dr. I Made Ginarsa, S.T., M.T.
Language	Indonesian
Relation to curriculum	Elective for electrical power systems
Teaching methods	Lecture, small group discussion, case base method.
Workload (incl. contact hours, self-study hours)	Contact minutes every week, each week of the 16 weeks/semester: • Lectures: 2×50 minutes • Exercises and Assignments: 2×60 minutes • Self-study: 2×60 minutes. Total study hours= 5 hours 40 minutes/week
Credit points	2 (~ 3,2 ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Students are able to explain the concepts supervisory control and data acquisition principle. 2. Students are able to explain function of SCADA equipment, standard for hardware/software.	PLO3
	3. Students are able to interpret and analyse the existing SCADA system. 4. Students are able to design small SCADA system.	PLO3 and PLO4
	5. Students are able to understand the need for lifelong learning of SCADA technology literacy in the context of engineering.	PLO9

Content	Main task of SCADA system: Monitoring (data acquisition) and control, management energy, management on distribution system (automation distribution). Standard on hardware and software SCADA system, expansion plan for 5 or 10 next years, flexibility, openness.
	Hardware and software on SCADA, man/human-machine interface (MMI/HMI), remote terminal unit (RTU) device, LAN on SCADA system, communication and computer server. Module on software, real time operation, logical and physical structure of database, logical database accesses, multiple databases. Energy market for now and next era, open energy market, model of energy (business) transaction and energy management system in future.
Examination forms	- Homework, - Written case study, - Présentation case study, Midterm and final test.

Study and examination requirements	The final grade in the module is composed of:
	
	  a. Exercise Report/ Homework/Portofolio: 15%
	  b. Projects: 55%
	  c. Midterm assessment: 15%
	  d. Final assessment: 15%
	Students must have a final grade of 65% or higher to pass

Reading list	1. Sugarjito, A.S., Maulana, A.H., Ruhdani, D., Solida, Wardoyo, R., Prakoso, Y.I., dan Chaerul, R., 2009, "SPLN S3.001:2008, Peralatan SCADA Sistem Tenaga Listrik", PT PLN (PERSERO), Jakarta. 2. Sumilih, Patonangi, A., Hardimasyar, T., Erwinsyah, N., Pramono, J., Pabisa, Y., dan Sembiring, J., 2009, "SPLN S4.001:2008, Pengujian Sistem SCADA", PT PLN (PERSERO), Jakarta. 3. Solida, Erwinsyah, N., Sugarjito, A.S., Chaerul, R., Hardimasyar, T., Pabisa, Y., Pramono, J., dan Ruhdani, D., 2009(1), "SPLN S5.001:2008, Teleinformasi Data untuk Operasi Jaringan Tenaga Listrik", PT PLN (PERSERO), Jakarta. 4. Solida, Erwinsyah, N., Sugarjito, A.S., Chaerul, R., Hardimasyar, T., Pabisa, Y., Pramono, J., dan Ruhdani, D., 2009(2), "SPLN S5.002:2008, Teleinformasi Data untuk Pemeliharaan Instalasi Tenaga Listrik", PT PLN (PERSERO), Jakarta. 5. Solida, Maulana, A.H., Prakoso, Y.I., Riasa, I.P., Sembiring, J., dan Pabisa, Y., 2009, "SPLN S6.001:2008, Perencanaan dan`Pembangunan Sistem SCADA", PT PLN (PERSERO), Jakarta. 6. Chaerul, R., Hardimasyar, T., Sugarjito, A.S., Erdiansyah, N., Agustien, F., Wardoyo, R., dan Ruhdani, D., 2009, "SPLN S7.001:2008, Operasi dan Pemeliharaan sistem SCADA", PT PLN (PERSERO), Jakarta. 7. Pandjaitan, B., 1999, "Teknologi Sistem Pengendalian Tenaga Listrik Berbasis SCADA", Prenhallindo, Jakarta.