<table>
<tr><th colspan="5">NATIONALLY HARMONISED B.Sc. CHEMICAL ENGINEERING PROGRAM</th></tr>
<tr><td>Course Code</td><td colspan="4">ChEg4183</td></tr>
<tr><td>Course Name</td><td colspan="4">Process Control and Dynamics</td></tr>
<tr><td>Degree Program</td><td colspan="4">B.Sc. in Chemical Engineering</td></tr>
<tr><td>Module Name</td><td colspan="4">Process Control and Instrumentation</td></tr>
<tr><td>Module Coordinator</td><td colspan="4">N.N.</td></tr>
<tr><td>Lecturer</td><td colspan="4">N.N.</td></tr>
<tr><td>Instructor’s contact information</td><td colspan="4">Office
Phone
E-mail
Office hour</td></tr>
<tr><td>ECTS Credits</td><td colspan="4">6</td></tr>
<tr><td rowspan="2">Students work load (per week)</td><td>Lecture</td><td>Tutorial</td><td>Laboratory or Practice</td><td>Home study</td></tr>
<tr><td>3</td><td>2</td><td>2</td><td>3</td></tr>
<tr><td>Students work load(per semester)</td><td>48hrs</td><td>32hrs</td><td>32hrs</td><td>48hrs</td></tr>
<tr><td>Mode of delivery</td><td colspan="4">Parallel(per semester)</td></tr>
<tr><td>Course Objectives & Competences to be Acquired</td><td colspan="4">To provide students with the knowledge of process modeling & dynamics, process control, and control system analysis and design.
Develop fundamental and empirical models for dynamic processes.
Analyze properties of dynamic models and processes.
Analyze and tune PID controllers and more advanced controllers to achieve desired performance</td></tr>
<tr><td>Course Description/Course Contents</td><td colspan="4">Introduction to Process Control
what, why, where, how of process control
motivation for analysis of process dynamics control objectives
operating conditions and operating window
calculating control benefits - role of variation</td></tr>
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	Modeling and Analysis of Process Dynamics Model development procedure • degrees of freedom analysis • process examples • numerical and analytical solutions • linearization and deviation variables • Laplace transforms - properties and use • block diagrams and transfer functions • interpreting transfer functions - stability, gains, poles, zeros, damping coefficient • types of dynamic responses and characterization • empirical model identification - first-order plus dead time models • introduction to multi-input multi-output models and control Feedback Control • control -loop elements: effect on dynamics • failure modes for actuators
Pre-requisites	ChEg**4151(**Internship**)**
Semester	Year IV, Semester II
Status of Course	Compulsory
Teaching & Learning Methods	Lectures, laboratory work, tutorial, project work, Home Study
Assessment/Evaluation	Continuous Assessment.....50% • Project .....10% • presentation.....10% • Quizzes.....15% • Tests.....15% final examination.....50%
Course Policy	**Attendance**: As per harmonized academic policy **Assessments**: students are supposed to handle all assessments on time. **Cheating/plagiarism:**it is strictly forbidden and any misconduct is accountable per the students' code of conduct. Also, please do not chew gum, eat, listen to recorders or CD players, wear sunglasses, ortalk about personal problems. Please be sure to turn off pagers and cell phonesbefore class and exam sessions
Literature	**Text Book:**

	1. George Stephanopoulos, CHEMICAL PROCESS CONTROL, An Introduction to Theory and Practice, 2002, Prentice-Hal of India. 2. Marlin, T.E., Process Control: Designing Processes and Control Systems for Dynamic Performance, 2nd edition , McGraw-Hill, New York, 2000. 3. Dale E. Seborg, Thomas F. Edgar, and Duncan A. Mellichamp, Process Dynamics and Control, 2nd edition, John Wiley and Sons, New York (2003).
Approval Section	**Module team**