<table>
<tr><th colspan="5">NATIONALLY HARMONISED B.Sc. CHEMICAL ENGINEERING PROGRAM</th></tr>
<tr><td>Course Code</td><td colspan="4">ChEg3122</td></tr>
<tr><td>Course Name</td><td colspan="4">Reaction Engineering II</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">Reaction and Biochemical Engineering</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:
Email:
Office hour:</td></tr>
<tr><td>ECTS Credits</td><td colspan="4">5CP</td></tr>
<tr><td rowspan="2">Contact hours (per Week)</td><td>Lecture</td><td>Tutorial</td><td>Lab/ practice</td><td>Home study</td></tr>
<tr><td>3</td><td>2</td><td>0</td><td>3</td></tr>
<tr><td>Student work load (hrs per semester)</td><td>48</td><td>32</td><td>0</td><td>48</td></tr>
<tr><td>Mode of Delivery</td><td colspan="4">Parallel (Semester wise)</td></tr>
<tr><td>Course Objectives & Competences to be Acquired</td><td colspan="4">The course aims to enable students to designvarious chemical reactors.
Upon the completion of the course. The students will able to
✓ Apply the basic principles in reactors sizing and operation in chemical industry.
✓ design of isothermal and non isothermal ideal batch and flow reactors for single and multiple reactions and the analysis of non-ideal reactors;
✓ Analyze non ideal reactor and develop model for non-ideal reactors.</td></tr>
<tr><td>Course Description/Course Contents</td><td colspan="4">1. Overview
1.1. Reactor Design and its Applications
2. Design of Isothermal Ideal Reactors.
2.1. Ideal reactors for a single reaction
2.2. Batch reactor</td></tr>
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	2.3. Steady state mixed flow reactor 2.4. Steady state plug flow reactor 2.5. Semi-batch reactor 3. Design for single reactions 3.1. Comparison of reactors 3.2. Multiple reactor systems 3.3. Recycle reactor 3.4. Autocatalytic reactions 4. Design for Multiple Reactions 4.1. Integral reactor 4.2. Stirred batch reactor 4.3. Continuous stirred tank reactor(CSTR) 4.4. Straight through transport reactor 5. Non-isothermal Reactor Design 5.1. The Energy Balance 5.2. Continuous Flow Reactor 5.3. Continuous Stirred Tank Reactor 5.4. Adiabatic Tubular Reactor 5.5. Tubular Reactor with Heat Exchange 5.6. Equilibrium Conversion 5.7. Multiple Steady States 5.8. Unsteady State CSTR 5.9. Batch Reactors 6. Catalytic Reactors 6.1. Packed Bed Reactors 6.2. Moving Bed Reactors 6.3. Catalytic Deactivation 7. Non-Ideal Flows and Reactor Models 7.1. Residence Time Distribution in Reactors 7.2. Reactor Models 7.3. Axial dispersion model 7.4. Tanks-in-series model
Pre-requisites	ChEg3121 (Reaction Engineering I)
Semester	Year III, Semester II
Status of Course	Compulsory
Teaching & Learning Methods	Classroom contact/Lecture, group work, interactive tutorial sessions (group and pair work/discussions and individual work (independent learning)
Assessment/Evaluation	Continuous Assessment.....50% • Assignments.....15% • Quizzes.....15% • Tests.....10% • Presentation.....10%

	Final Exam.....50%
Course Policy	**Attendance**: As per the harmonized academic policy **Assessments**: Students are supposed to handle all the assessments on time. **Cheating/ Plagiarism**: It is strictly forbidden and any miss conduct is accountable as per the students code of conduct.
Literature	**Text Book:** 1. Fogler, HS(1992) Elements of Chemical Reaction Engineering, Prentice-Hall Inc **Reference Books** 1. Levenspiel, O(2002) Chemical Reaction Engineering, John Wiely& Sons, 3rd edition 2. Smith, JM (1981) Chemical Engineering Kinetics, McGraw-Hill, 2nd edition 3. Froment, GF and Bischoff, KB(1999), Chemical Reactor Analysis and Design, John Wiley & Sons 4. Perry., Chemical Engineers Hand Book
Approval Section	**Module Team/ Course Chair**