1. Course No: CHE6XX

2. Course Title: An Introduction to Mathematical Medicine

3. Per Week Lectures:__3_(L), Tutorial: _0__(T), Laboratory: _0___(P), Additional Hours[0-2]: _0__(A),

Credits (3*L+2*T+P+A): 3L-0-0-0____ Duration of Course: Full Semester

4. Proposing Department/IDP : Chemical engineering

Other Departments/IDPs which may be interested in the proposed course: BSBE, CHM, PHY

Other faculty members interested in teaching the proposed course:

5. Proposing Instructor(s): Dr. Raghvendra Singh

6. Course Description:

A) Objectives: Students taking this course will learn about a theoretical and mathematical understanding of various human diseases.

B) Contents (preferably in the form of 5 to 10 broad titles):

1. Hormone circuits (4)

2. Dynamical compensation, mutant resistance, and type-2 diabetes (4)

3. The stress hormone axis as a two-gland oscillator (5)

4. The thyroid and its discontents (4)

5. Autoimmune diseases as a fragility of mutant surveillance (5)

6. Inflammation and fibrosis as a bistable system (4)

7. Basic facts of aging (4)

8. Aging and Saturated repair (5)

9. Age-related diseases (4)

Total lectures: 39

C) Pre-requisites, if any (examples: a- PSO201A,or b- PSO201A or equivalent): None

D) Short summary for including in the Courses of Study Booklet

Physiological circuits of hormones, immune circuits, and aging and age-related diseases

7. Recommended books:

Textbooks: Systems Medicine by Uri Alon

Reference Books:

8. Any other remarks: None

Dated:__Aug 14, 2025_____ Proposer:_Raghvendra Singh_____

Dated:_____ DUGC/DPGC Convener:_____

The course is approved / not approved

Chairman, SUGC/SPGC

Dated:_____