課程名稱：BMES525400 組織工程 (102 學年度下學期)
學分數：3
時間：Wednesday 2, 3, 4
地點：醫環系 R517
授課老師：張建文 (C.W. Chang)
助教：莊鈞喬
學習目標：本課程的教學目標在於使修課同學能對當代組織工程發展取得深入的認識，因此在課程內容將涵蓋三大部分，包括：(1) 細胞組織學、(2) 組織工程相關材料與技術、(3) 組織工程應用實例。為了涵蓋組織工程的理論基礎與實際應用，本課程將採以 **50%課堂講解與 50%期刊論文報告/討論**的方式進行。

課程內容:

Date	Topic	Tissue Engineering/Bhatia	Tissue Engineering/Langer
L1	Introduction	Ch.1	Ch.1~4
L2	Cell biology basics Tissue Organization/dynamics	Ch.2~3	Ch.5~8
L3	Growth factors/Mechanochemical control of cell fate switching Engineering functional tissues/regulation of cell behavior by extracellular proteins	Ch.7 Ch.7	Ch.14~15 Ch.11~13
L4	Embryonic stem cell: Morphogenesis/Gene expression, cell differentiation	Ch.4~6	Ch.9~10
L5	Adult stem cell	Ch.5	
L6	Biomaterials I: Micro-scale cell patterning/Cell interactions with polymers		Ch.19~20
L7	Biomaterials II: Matrix effects/Polymer scaffold fabrication/biodegradable polymers	Ch.15~16	Ch.21~23
期中考			
L8	Biomaterials III: Micro-and Nanofabricated scaffolds/Three-dimensional scaffolds		Ch.24~25
L9	Gene therapy I		Ch.34
L10	Gene therapy II		Ch.35
L11	Cardiovascular system		Ch.37~40
L12	Musculoskeletal system I		Ch.55~58
L13	Musculoskeletal system II		Ch.59~62
L14	Skin		Ch.75~77

上課參考資料:

1. Principle of Tissue Engineering, 3rd edition Edited by Robert Lanza, Robert Langer and Joseph Vancanti, Academic Press. (The electronic copy is available from NTHU library)
2. Tissue Engineering, Bernhard ø. Palsson and Sangeeta N. Bhatia.
3. Journal papers

評分標準

上課參與 10%

口頭專題報告 20%

書面專題報告 20%

期中考 50%