School of Natural Sciences and Mathematics

Molecular Biology and Healthcare Management (Double Major) (BS)

Bachelor of Science in Molecular Biology and Healthcare Management (Double Major)

**Degree Requirements** (152-153 semester credit hours)\(^1\, 2\)

JSOM Faculty


**Associate Professors:** Mehmet Ayvaci, Nina Baranchuk, Norris Bruce, Zhonglan Dai, Rebecca Files, Dorothée Honhon, Bin Hu, Kyle Hyndman, Surya N. Janakiraman, Robert L. Kieschnick Jr., Atanu Lahiri, Jun Li, Ningzhong Li, Lívia Markóczy, Amit Mehra, Toyah Miller, Ramachandran (Ram) Natarajan, Naim Bugra Ozel, H. Dennis Park, Cuili Qian, Young U. Ryu, Gil Sadka, Harpreet Singh, David J. Springate, Upender Subramanian, Shaojie Tang, Kelsey D. Wei, Han (Victor) Xia, Yexiao Xu, Alejandro Zentner, Jiying Zhang, Yuan Zhang, Feng Zhao, Yibin Zhou

**Assistant Professors:** Khai Chiong, Emily Choi, Andrew Frazelle, Ying Huang, Joonhwi Joo, Sora Jun, Sheen Levine, Meng Li, Maria Loumioti, Jean-Marie Meier, Radha Mookerjee, Anyan Qi, Alejandro Rivera Mesías, Alessio Saretto, Simon Siegenthaler, Serdar Simsek, Xiaoxiao Tang, Shervin Tehrani, Ashwin Venkataraman, Christian Von-Drathen, Guihua Wang, Shouqiang Wang, Junfeng Wu, Steven Xiao, Yingjie Zhang, Zhe (James) Zhang, Xiaofei Zhao

**Professor Emeritus:** John J. Wiorkowski

**Assistant Professors Emeriti:** J. Richard Harrison, Jane Salk

**Clinical Professors:** John Barden, Britt Berrett, Abhijit Biswas, Shawn Carraher, Larry Chasteen, David Cordell, Howard Dover, John Gamino, Randall S. Guttery, William Hefley, Marilyn Kaplan, Sonia Leach, Peter Lewin, Jeffrey Manzi, Diane S. McNulty, Divakar Rajamani, Daniel Rajaratnam, Kannan Ramanathan, David Ritchey, Mark Thouin, McClain Watson, Jeff Weekley, Habte Woldu, Fang Wu, Laurie L. Ziegler

**Clinical Associate Professors:** Shawn Alborz, Dawn Owens, Carolyn Reichert, Avanti P. Sethi, Ramesh
Subramoniam, Aysegul Toptal, David Widdifield

**Clinical Assistant Professors:** Athena Alimirzaei, Moran Blueshtein, Judd Bradbury, Sourav Chatterjee, Jerome Gafford, Ayfer Gurun, Jeffery (Jeff) Hicks, Revansiddha Khanapure, Kristen Lawson, Kathryn Lookadoo, Liping Ma, Sarah Moore, Ravi Narayan, Parneet Pahwa, Jason Parker, Drew Peabody, Nassim Sohaee

**Professor of Instruction:** Charles Hazzard

**Associate Professor of Instruction:** Maria Hasenhuttl

**Assistant Professors of Instruction:** Julie Haworth, Rasoul Ramezani

**Professors of Practice:** Ranavir Bose, Rajiv Shah

**Associate Professor of Practice:** David Parks

**Senior Lecturers:** Khatereh Ahadi, Semiramis Amirpour, Tiffany A. Bortz, Richard Bowen, Monica E. Brussolo, Juliann Chapman, George DeCourcy, Alexander Edsel, Amal El-Ashmawi, Negin Enayat Ahangar, Mary Beth Goodrich, Thomas (Tom) Henderson, Abu Naser Islam, Scott Janke, Jennifer G. Johnson, Jackie Kimzey, Chris Linesteadt, Joseph Mauriello, Victoria D. McCrady, Edward Meda, Robert (Stephen) Molina, Prithi Narasimhan, Mohammad Naseri Taheri, Madison Pedigo, Matt Polze, Gaurav Shekhar, Margaret Smallwood, Steven Solcher, Timothy Stephens, Luell (Lou) Thompson, Guido Tirone, Robert Wright, Kathy Zolton, Hubert Zydorek

**NSM Faculty**

**Professors:** Rockford K. Draper, Juan E. González, Lawrence J. Reitzer, Stephen Spiro, Li Zhang, Michael Qiwei Zhang

**Associate Professors:** John G. Burr, Jeff L. DeJong, Nikki Delk, Tae Hoon Kim, Kelli Palmer, Duane D. Winkler, Zhenyu Xuan, xd131030

**Assistant Professors:** Zachary Campbell, Nicole De Nisco, Jyoti Misra, Faruck Morcos

**Professors Emeriti:** Hans Bremer, Lee A. Bulla, Donald M. Gray

**Associate Professors Emeriti:** Gail A. M. Breen, Dennis L. Miller

**Clinical Professor:** David Murchison

**Research Assistant Professors:** Lan Guo, Li Liu

**Professors of Instruction:** Scott A. Rippel, Uma Srikanth

**Associate Professors of Instruction:** Mehmet Candas, Wen-Ju Lin, Elizabeth Pickett, Ilya Sapozhnikov, Michelle Wilson

**Assistant Professors of Instruction:** Caitlin Braitsch, Ida Klang, Iti Mehta, Jing Pan, Eva Sadat, Subha Sarcar, Zhuoru Wu

**Senior Lecturers:** Meenakshi Maitra, Ruben D. Ramirez, Wen-Ho Yu

I. Core Curriculum Requirements: 42 semester credit hours³
Communication: 6 semester credit hours

Select any 6 semester credit hours from Communication Core courses (see advisor)

Mathematics: 3 semester credit hours

**MATH 2417** Calculus I\(^6\), 5, 6, 7, 8

or **MATH 2413** Differential Calculus\(^6\), 5, 6, 7, 8

Or select any 3 semester credit hours from Mathematics Core courses (see advisor)

Life and Physical Sciences: 6 semester credit hours

**CHEM 1311** General Chemistry I\(^5\)

or **CHEM 1315** Honors Freshman Chemistry I\(^5\)

**CHEM 1312** General Chemistry II\(^5\)

or **CHEM 1316** Honors Freshman Chemistry II\(^5\)

Or select any 6 semester credit hours from Life and Physical Sciences Core courses (see advisor)

Language, Philosophy and Culture: 3 semester credit hours

Select any 3 semester credit hours from Language, Philosophy and Culture Core courses (see advisor)

Creative Arts: 3 semester credit hours

Select any 3 semester credit hours from Creative Arts Core courses (see advisor)

American History: 6 semester credit hours

Select any 6 semester credit hours from American History Core courses (see advisor)

Government/Political Science: 6 semester credit hours

**GOVT 2305** American National Government

**GOVT 2306** State and Local Government

Or select any 6 semester credit hours from Government/Political Science Core courses (see advisor)

Social and Behavioral Sciences: 3 semester credit hours

Choose one of the following:\(^9\)

**BA 1310** Making Choices in Free Market Systems\(^6\), 5

**BA 1320** Business in a Global World\(^6\), 5

**ECON 2301** Principles of Macroeconomics\(^6\), 5
ECON 2302 Principles of Microeconomics\textsuperscript{4, 5}

Or select any 3 semester credit hours from Social and Behavioral Sciences Core courses (see advisor)

Component Area Option: 6 semester credit hours

Choose two of the following:\textsuperscript{9}

\textbf{MATH 2419} Calculus II\textsuperscript{5, 6, 10}

or \textbf{MATH 2414} Integral Calculus\textsuperscript{5, 6, 10}

\textbf{BA 1310} Making Choices in Free Market Systems\textsuperscript{6, 5}

\textbf{BA 1320} Business in a Global World\textsuperscript{6, 5}

\textbf{ECON 2301} Principles of Macroeconomics\textsuperscript{6, 5}

\textbf{ECON 2302} Principles of Microeconomics\textsuperscript{6, 5}

Or select any 6 semester credit hours from Component Area Option Core courses (see advisor)

II. Major Requirements: 89-90 semester credit hours

Biology Major Preparatory Courses: 20-21 semester credit hours beyond Core Curriculum

\textbf{CHEM 1111} General Chemistry Laboratory I

or \textbf{CHEM 1115} Honors Freshman Chemistry Laboratory I

\textbf{CHEM 1112} General Chemistry Laboratory II

or \textbf{CHEM 1116} Honors Freshman Chemistry Laboratory II

\textbf{CHEM 1311} General Chemistry I\textsuperscript{5}

or \textbf{CHEM 1315} Honors Freshman Chemistry I\textsuperscript{5}

\textbf{CHEM 1312} General Chemistry II\textsuperscript{5}

or \textbf{CHEM 1316} Honors Freshman Chemistry II\textsuperscript{5}

\textbf{CHEM 2123} Introductory Organic Chemistry Laboratory I\textsuperscript{4}

\textbf{CHEM 2125} Introductory Organic Chemistry Laboratory II\textsuperscript{4}

\textbf{CHEM 2323} Introductory Organic Chemistry I\textsuperscript{4}

\textbf{CHEM 2325} Introductory Organic Chemistry II\textsuperscript{4}

\textbf{MATH 2417} Calculus I\textsuperscript{4, 5, 6, 7, 8}

or \textbf{MATH 2413} Differential Calculus\textsuperscript{5, 6, 7, 8}

\textbf{MATH 2419} Calculus II\textsuperscript{5, 6, 10}

or \textbf{MATH 2414} Integral Calculus\textsuperscript{5, 6, 10}
**PHYS 2325** Mechanics and **PHYS 2125** Physics Laboratory I

or **PHYS 2421** Honors Physics I - Mechanics and Heat

**PHYS 2326** Electromagnetism and Waves

or **PHYS 2422** Honors Physics II - Electromagnetism and Waves

**PHYS 2126** Physics Laboratory II

**Biology Core Courses: 33 semester credit hours**

**BIOL 2111** Introduction to Modern Biology Workshop I

**BIOL 2112** Introduction to Modern Biology Workshop II

**BIOL 2281** Introductory Biology Laboratory

**BIOL 2311** Introduction to Modern Biology I

**BIOL 2312** Introduction to Modern Biology II

**BIOL 3101** Classical and Molecular Genetics Workshop

**BIOL 3102** Eukaryotic Molecular and Cell Biology Workshop

**BIOL 3161** Biochemistry Workshop I

**BIOL 3162** Biochemistry Workshop II

**BIOL 3301** Classical and Molecular Genetics

**BIOL 3302** Eukaryotic Molecular and Cell Biology

**BIOL 3361** Biochemistry I

**BIOL 3362** Biochemistry II

or **BIOL 3335** Microbial Physiology

**BIOL 3380** Biochemistry Laboratory

**BIOL 4461** Biophysical Chemistry

**Business Major Preparatory Courses: 12 semester credit hours beyond Core Curriculum**

**ACCT 2301** Introductory Financial Accounting

**ACCT 2302** Introductory Management Accounting

**BLAW 2301** Business and Public Law

**OPRE 3360** Managerial Methods in Decision Making Under Uncertainty

or **STAT 2332** Introductory Statistics for Life Sciences

or **STAT 3360** Probability and Statistics for Management and Economics

Choose two of the following:
BA 1310 Making Choices in Free Market Systems\textsuperscript{a, b} 5
or ECON 2302 Principles of Microeconomics\textsuperscript{a, b} 5

BA 1320 Business in a Global World\textsuperscript{a, b} 5
or ECON 2301 Principles of Macroeconomics\textsuperscript{a, b} 5

**Business Core Courses: 24 semester credit hours**

BCOM 1300 Introduction to Professionalism and Communication in Business\textsuperscript{12}
   or BCOM 3300 Professionalism and Communication in Business\textsuperscript{12}

BCOM 4300 Managing Communications in Business

IMS 3310 International Business

FIN 3320 Business Finance

OPRE 3310 Operations Management

ITSS 3300 Information Technology for Business

OBHR 3330 Introduction to Human Resource Management
   or OBHR 3310 Organizational Behavior

MKT 3300 Principles of Marketing

**III. Elective Requirements: 21 semester credit hours**

A practicum experience of at least 160 working hours is required:

HMGT 4090 Healthcare Management Internship\textsuperscript{13}

BA 4090 Management Internship\textsuperscript{13}

A community engagement experience is required:

BA 4095 Social Sector Engagement and Community Outreach Practicum\textsuperscript{14}

**Healthcare Management Core Courses: 18 semester credit hours**

HMGT 3301 Introduction to Healthcare Management

HMGT 3310 Healthcare Regulatory Environment

HMGT 3311 Healthcare Financial Analysis

HMGT 3320 Complex and Dynamic Healthcare Environment
   or ECON 3330 Economics of Health

HMGT 4321 Introduction to Healthcare Information Systems

HMGT 4395 Capstone Senior Project - Healthcare Management
Biology (3 semester credit hours):

**BIOL 4380** Cell and Molecular Biology Laboratory

or **BIOL 3V96** Undergraduate Research in Molecular and Cell Biology

or **BIOL 4391** Senior Research in Molecular and Cell Biology

or **BIOL 4399** Senior Honors Research for Thesis in Molecular and Cell Biology

All students must complete at least 51 semester credit hours of upper-division courses to graduate.

1. Incoming freshmen must enroll and complete requirements of UNIV 1010 and the corresponding school-related freshman seminar course. Students, including transfer students, who complete their core curriculum at UT Dallas must take UNIV 2020.
2. Degree is 153-154 semester credit hours if students are required to take NATS 1101.
3. Curriculum Requirements can be fulfilled by other approved courses from institutions of higher education. The courses listed are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.
4. Indicates a prerequisite class to be completed before enrolling for upper-division classes.
5. A required Major course that also fulfills a Core Curriculum requirement. Semester credit hours are counted in Core Curriculum.
6. Six semester credit hours of Calculus are counted under Mathematics Core and Component Area Option Core, and 2 semester credit hours of Calculus are counted as Biology Major Preparatory Courses.
7. Students may elect to substitute MATH 2417 for MATH 2413.
8. In order to make timely degree progress, students should complete MATH 2413 or MATH 2417 by the end of their first semester at UT Dallas. Students who will not meet this requirement should contact their academic advisor to discuss their degree timeline.
9. Certain courses listed are prerequisites for major core, major concentration, or major related courses. Choose accordingly.
10. Students may elect to substitute MATH 2419 for MATH 2414.
11. Students who complete PHYS 2421 do not need to complete PHYS 2125.
12. JSOM first-time-in-college freshmen are required to take BCOM 1300 in their first semester. Transfer students and students new to JSOM are required to take BCOM 3300 in their first semester.
13. Students may fulfill the internship requirement with HMGT 4090, BA 4090, or HMGT 4v90 (1-3 semester credit hours). The zero semester credit hour courses HMGT 4090 or BA 4090 are
recommended as the most efficient way to satisfy this requirement.

14. Students may fulfill the community engagement requirement with BA 4095, IMS 4335, ENTP 4340, or MKT 4360. The zero semester credit hour course BA 4095 is recommended as the most efficient way to satisfy this requirement.

15. Requires permission of the Biology Undergraduate Advisor to ensure training in recombinant DNA analysis.

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