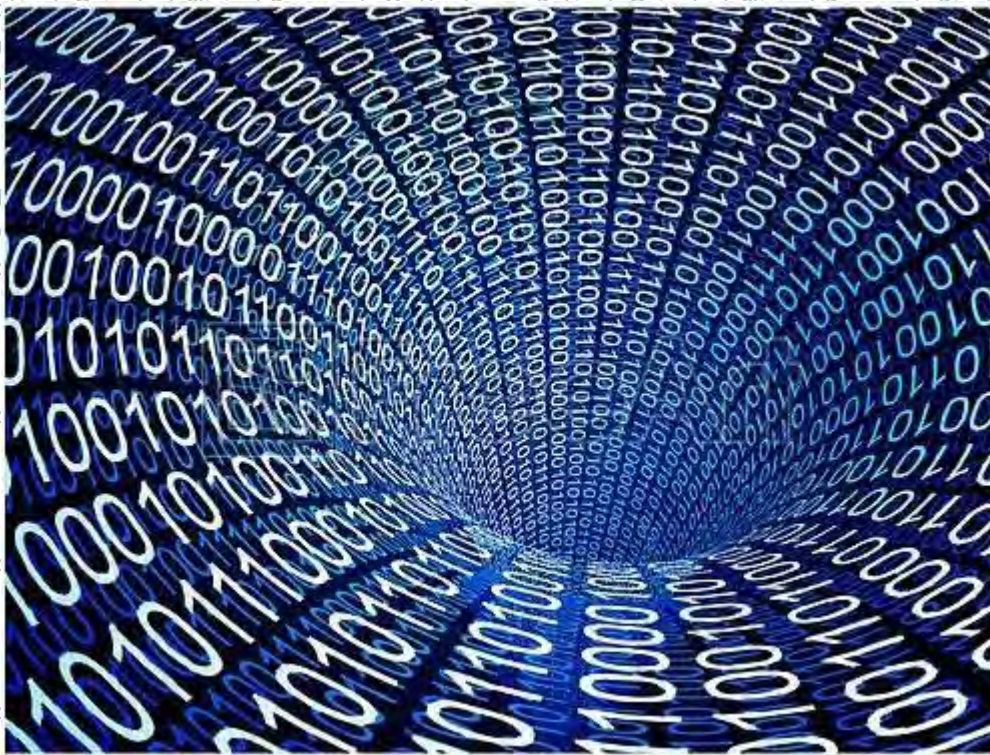


2021-2022
Program, Policies, and Guidelines

**Certificate in Biomedical Data Science
(CBDS)**



Graduate School of Biomedical Sciences
UT Health San Antonio

Certificate in Biomedical Data Science (BDS) Program policies and guidelines are in compliance with those established by the UT System (<http://www.utsystem.edu/>) Board of Regents (<http://www.utsystem.edu/bor/rules/>), The UTHSCSA (<http://www.uthscsa.edu/hop2000/>), and the Graduate School of Biomedical Sciences (<http://gsbs.uthscsa.edu/>). The *Catalog* (<http://catalog.uthscsa.edu/>) of The UTHSCSA provides general information and regulations that relate to students. In the event of discrepancies between MSCI-TS Program policies/guidelines and those established by UT governing components, those described by the governing components will prevail.

Please note that the policies of the BDS Program are regularly reviewed and updated; therefore, this printed copy may not be the most current. Current policies are provided in the BDS Handbook that is electronically available at the BDS website: (https://iims.uthscsa.edu/ed_certificate_in_bds.html)



CBDS Program

IIMS/OREM – MC 7757
UT Health San Antonio
7703 Floyd Curl Drive
San Antonio, Texas 78229-3900
210-567-4304 (voice)
E-mail: machuca@uthscsa.edu

The UT Health Science Center at San Antonio is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (<http://www.sacscoc.org/>) (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404-679-4501) to award certificates, and baccalaureate, masters, doctoral, and professional degrees.

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Certificate in Biomedical Data Science (CBDS)

Program, Policies, and Guidelines

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THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT SAN ANTONIO
GRADUATE SCHOOL OF BIOMEDICAL SCIENCES (GSBS)

Certificate in Biomedical Data Science

AIMS/OBJECTIVES

The goal of this program is to provide graduate students, postdoctoral fellows, faculty, and other healthcare professionals with the fundamental understanding and abilities to utilize data science programming and tools to make data driven discoveries and develop user friendly and powerful data science applications, cross-cutting best practices for developing informative visualizations, application of supervised and unsupervised techniques for machine learning, and the ability to assess and optimize artificial intelligence solutions for real-world performance.

The specific aims of the Biomedical Data Science Certificate Program are to:

- Support the intellectual environment at the UT Health Science Center at San Antonio for biomedical data centric and informatics research.
- Provide fundamental curricular activities in the biomedical data science to UT Health Science Center at San Antonio students, postdoctoral trainees, clinical residents and fellows, and faculty from the Schools of Medicine, Nursing, Dentistry, Health Professions, and Graduate School of Biomedical Sciences (GSBS) as well as from local organizations that are partnered with UT Health Science Center at San Antonio.

The aims of the CBDS program will be achieved *via* participation and successful completion of required didactic coursework.

Certificate Program Governance

Oversight for the routine operations and implementation of the Biomedical Data Science Certificate Program will be provided by the Master of Science in Clinical Investigation and Translational Science (MSCI-TS) Program and the corresponding MSCI-TS Committee on Graduate Studies (COGS).

Admission Requirements

All students should have a sufficient educational background in the quantitative computational or biomedical sciences prior to admission to the program. It is expected that most students will have a health professional degree (*e.g.*, MD, DDS/DMD, DVM, or BS in nursing and/or allied health) or a BS/BA, MS, or PhD degree with emphasis in statistics, data science or a health-related discipline. The following general requirements will be applied:

- A medical, dental, masters and/or baccalaureate **degree** from an accredited institution in the United States or an U.S. equivalent degree and training at an international institution. All transcripts from international institutions (including GPA) must be evaluated and submitted by an approved [NACES member](#) foreign credentialing evaluation agency. The CTS preferred agencies are: The Educational Credential Evaluators, Inc. (**ECE**) or the World Education Services, Inc. (**WES**).
- A **Grade Point Average** (GPA) no lower than a B (3.00 in a 4.00 system) in the last 60 hours of coursework for a BS/BA degree or a GPA of at least 3.0 for applicants with a MS degree.
- A minimum score of 84 on the internet version of the Test of English as a Foreign Language (**TOEFL**) or band score of 7 on the academic version of the International English Language Testing System (**IELTS**) for our international applicants. Scores on the TOEFL and IELTS (academic version) tests taken more than two years prior to the date of application will not be accepted.

Applicant Documentation Requirements

Applicants should utilize the [checklist](#) of required documentation for admission that is provided in the Appendix of this Handbook.

All the **required** information previously described **must** be submitted in order for an applicant to be considered by the MSCI-TS Student Admissions Committee. Requests for an exemption to any of these general admission requirements should be addressed to the CBDS Program Director and sent directly to the CBDS Program Coordinator at the address below.

Required Documentation:

1. **Completed and submitted GSBS on-line application.** The GSBS on-line application can be found on the GSBS homepage at <http://gsbs.uthscsa.edu/>.

2. **Official transcripts** from ALL colleges and universities attended.
3. **Course by Course Translation of foreign** transcripts to include GPA and U.S. degree equivalency by the ECE or WES agencies.
4. **Official TOEFL or IELTS (academic version) scores** taken within the past two (2) years for International applicants.
5. **Three (3) Letters of Recommendation** attesting to the applicant's readiness for graduate level studies in biomedical data science. These letters should be uploaded to the Recommendation Form by the individual recommenders who will receive an email from the on-line application system (EMBARC) with a link to the Recommendation Form.
 - Residents or fellows in an approved UT Health San Antonio residency or fellowship program are required to submit one (1) of the three (3) letters from their departmental chair or program director with a statement indicating the availability and approval of release of time for the completion of the CBDS educational activities.
 - Staff employed at UT Health San Antonio are required to submit one (1) of the three (3) letters from their authorized supervisor with a statement indicating the availability and approval of release time for the completion of the CBDS educational activities.
 - Faculty (*non-tenured only*) at UT Health San Antonio are required to submit one (1) of the three (3) letters from the Chair of their department. In addition, the Chair's letter must have the approval of both the Dean of the school that houses the department and the President (or his designee) of UT Health San Antonio. (See the Handbook of Operating Procedures (HOP), Policy 3.2.5)
6. A **Statement of Purpose (a.k.a. Personal Statement)** (1-2 pages) that includes a brief description of the applicant's background, long term research and/or career goals, and an indication of the basis for application into the CBDS Program including how this program fits into the applicant's career objectives. The Statement of Purpose should be submitted with the on-line application to the GSBS.
7. A **current curriculum vitae**. This should be submitted with the on-line application to the GSBS.
8. **Copy of U.S. Medical License/Certificate** for licensed health care professionals.

Official test scores, transcripts, and international transcript translations, mentioned above, should be sent to:

Registrar's Office-Graduate Admissions MSC 7702
The UT Health Science Center at San Antonio
7703 Floyd Curl Drive
San Antonio, Texas 78229-3900

gsprospect@uthscsa.edu

Phone: 210-567-2667

Academic Coordinator
CBDS Program
(210) 567-4304

Application Process

Application. An [online application](http://gsbs.uthscsa.edu/) for admission into the CBDS Program must be processed through the UT Health Science Center at San Antonio Graduate School of Biomedical Sciences (GSBS). This application is available at: : <http://gsbs.uthscsa.edu/>.

As described in the on-line application for admission into the GSBS, official transcripts from **ALL** colleges and universities attended by the applicant are required; these must be submitted in sealed institutional envelopes. In addition, all transcripts from foreign institutions must be evaluated and submitted by one of the above mentioned approved foreign credentialing evaluation agencies. Official GRE and TOEFL or IELTS (academic version) test scores must also be submitted

Deadlines. The CBDS Program has an open application policy and will accept applications for admission at any time. However, *GSBS deadlines* (for submission of application and required documentation) for matriculation in a specific academic semester are listed below.

- Fall Semester April 1
- Spring Semester October 1

Applicants will have the responsibility for the timely submission of application materials in order to meet the deadlines established by the GSBS for registration and course enrollment.

Application Review. Operational processes used by the CBDS Program are provided by the Master of Science in Clinical Investigation and Translational Science (MSCI-TS) Student Admissions Committee (SAC). Thus, after receipt of the on-line application together with all of the required admission materials outlined above, the MSCI-TS SAC will review and provide a recommendation to the Dean of the GSBS.

Each application will be individually reviewed to consider: the applicant's undergraduate and graduate course work and degree(s), scores on the TOEFL or IELTS (academic version), if applicable tests, research experience, and all other required documentation submitted with the online application. Research experience is not required but may be beneficial. The admission decision is based on the personal statement as well as record of academic achievement, professional experience, coursework, and letters of recommendation.

After sequential review by the MSCI-TS SAC, and the GSBS, applicants will be formally notified of the outcome by the Graduate Dean of the UT Health Science Center at San Antonio. The MSCI-TS SAC recommends admission to the most highly qualified applicants regardless of ethnicity, gender, age, sexual orientation, nation of origin, or disability.

After acceptance, students may complete the requirements for certificate completion while enrolled as either a full-time or part-time student.

Graduate students who are enrolled in the Master of Science in Clinical Investigation and Translational Science (MSCI-TS) Program or the Certificate in Translational Science (CTS) Program are ineligible to concurrently enroll in the CBDS Program. However, coursework accomplished towards the Certificate in Biomedical Data Science may be applied to the MSCI-TS degree or the CTS.

Tuition and Fees

Tuition and Fees. Rates for in state and out-of-state graduate student tuition and fees are established by the institution and subject to adjustment. A summary of current rates is provided in the Appendix.

Student Pathways in the CBDS Program

After acceptance as a student working towards the certificate, you may undertake course requirements for graduation while enrolled as either a full-time or part-time student.

Full-Time Students. Full-time students are enrolled in at least eight (8) semester credit hours (SCH) during the Fall and Spring semesters.

Part-time Students. Part-time students are enrolled for **less than** eight (8) SCH credit hours per semester during the Fall or Spring semesters. A part-time student must enroll in **at least** four (4) SCH per semester.

UT Health Science Center at San Antonio Faculty and Staff as Students in the CBDS Program. UT Health Science Center at San Antonio faculty and staff may apply for admission in the CBDS Program. The amount of course work that can be taken by faculty or staff in a given semester is subject to the ‘quantity of work’ rules outlined in the current UT Health Science Center at San Antonio [Catalog](#) and [Handbook of Operating Procedures](#) (HOP).

Non-Degree Seeking Students in the GSBS. Non-degree seeking students may enroll in courses and receive GSBS course credit *without* matriculation (admission) into a graduate program. For those not already matriculated into other GSBS graduate programs, an [on-line application](#) must be submitted to the GSBS for approval by the Dean [this would also include faculty, staff, or others]. The appropriate course director or the MSCI-TS Academic Programs Coordinator must approve the enrollment of any non-degree seeking student in all MSCI-TS courses and sign course cards (provided by the GSBS Dean’s Office).

Course credit earned as a non-degree seeking student can be applied towards a Certificate in Biomedical Data Science following formal application and acceptance into the CBDS Program. Note that enrollment as a non-degree seeking student in the GSBS is limited to four (4) semesters. Additional details about [non-degree seeking students](#) are available at: [UT Health Science Center at San Antonio GSBS website](#)

Certificate Requirements

Coursework. Completion of the CBDS Program requires the satisfactory completion of required and elective coursework. Sixteen (16) semester credit hours (SCH) of didactic coursework are required to obtain the CBDS. All course-related rules established by the CBDS program and listed in the [CBDS Handbook](#) will be endorsed and followed by the CBDS Program.

Required Courses. Students in the CBDS Program must successfully complete the following didactic courses.

TSCI 5070 (2 SCH)	<i>Responsible Conduct of Research</i>
TSCI 5201 (3 SCH)	<i>Advanced Statistics for Machine Learning Methods: Statistical Principles of Machine Learning applied to biomedical data</i>
TSCI 5230 (3 SCH)	<i>Programing for Biomedical Data Science</i>
TSCI 6202 (2 SCH)	<i>Data Visualization and Real-Time Analytics</i>
TSCI 6201 (1 SCH)	<i>Data Science Leadership in Healthcare</i>
TSCI 6203 (1 SCH)	<i>Practicum in Biomedical Data Science</i>
CSAT 6005 (1 SCH)	<i>Rigor & Reproducibility</i>

Elective Courses. Diverse elective courses are available to CBDS graduate students. These courses may be taken in any semester when offered and include:

TSCI 5050 (1 SCH)	<i>Introduction to Data Science</i>
TSCI 5073 (1 SCH)	<i>Integrating Molecular Biology with Patient-Oriented Clinical Research</i>
TSCI 5074 (2 SCH)	<i>Data Management, Quality Control, and Regulatory Issues</i>
TSCI 5075 (2 SCH)	<i>Scientific Communication</i>
TSCI 5077 (1-3 SCH)	<i>Practicum in Translation Science</i>
CSBL 6095 (2 SCH)	<i>Functional Genomics and Bioinformatics</i>
TSCI 6060 (2 SCH)	<i>Patient-Oriented Clinical Research Methods -2</i>
TSCI 6061 (2 SCH)	<i>Patient-Oriented Clinical Research Biostatistics - 2</i>
TSCI 6065 (2 SCH)	<i>Health Services Research</i>
TSCI 6067 (1 SCH)	<i>Genomic Healthcare</i>

TSCI 6069 (2 SCH)	<i>Statistical Issues, Planning, & Analysis of Contemporary Clinical Trials</i>
TSCI 6070 (2.5 SCH)	<i>Biostatistics Methods for Longitudinal Studies</i>
TSCI 6100 (1 SCH)	<i>Practicum in IACUC Procedures</i>
TSCI 6101 (1 SCH)	<i>Topics in Translational Science</i>
TSCI 6102 (1 SCH)	<i>Practicum in IRB Procedures</i>

Timeline for Coursework. A typical schedule for a full-time CBDS student is provided in the Appendix of this handbook.

Coursework towards a Certificate in Biomedical Data Science must be accomplished within three (3) or less years prior to request for certification. Exceptions to this requirement will be considered by the MSCI-TS COGS on a case-by-case basis. A written request for exemption must be submitted to the CBDS Program Director through the CBDS Program Coordinator and should include a brief description of the reason(s) for the request. The CBDS Program Director will make a recommendation to the MSCI-TS COGS who will provide the final program approval. It will then be submitted to the Graduate School Dean for final institutional approval.

Grade Requirement. As detailed by the MSCI-TS/CBDS Program, student performance in our courses are assessed on a satisfactory (S) / unsatisfactory (U) basis. Any student who receives less than a Satisfactory (S) assessment on any CBDS required course will be required to re-take the course and receive a passing grade during the next academic year. In the event of a second failure in the same course, the MSCI-TS COGS will provide a recommendation to the GSBS Dean as to whether or not the student should be dismissed from the CBDS Program.

Exemption of a Required Course. Exemption of the requirement for completion of a *required* course will be considered by the MSCI-TS COGS on a case-by-case basis. A written request for exemption must be submitted to the CBDS Program Director through the CBDS Program Coordinator and should include a brief description of the reason(s) for the request as well as documentation (publication copies, meeting abstracts, etc.) supporting the reason(s) for the request.

In the event that prior coursework is the basis for the request, the following documentation must be submitted to the CBDS Program Director through the CBDS Program Coordinator.

1. A written request that includes a comprehensive description of the prior course detailing when and where completed, course semester credit hours, and details of course content and objectives.
2. An official copy of the student’s transcript that indicates successful course completion and the grade issued.
3. A copy of the course description from the catalog that was in effect during the semester the course was taken.
4. A course syllabus is suggested but not required.

MSCI-TS COGS approval of a request for course exemption does not grant the student credit for the semester credit hours associated with the course. The semester credit hours for the exempted course can be obtained by taking a MSCI-TS/CBDS elective course or additional mentored research hours. Transfer of coursework for credit is described below.

Transfer of Coursework for Credit. If a student has successfully completed graduate level coursework that is duplicative of required or elective CBDS courses, it is possible that transfer of course credit may be allowed. A written request for consideration of transfer of course credit in substitution for a given CBDS course must include the following documentation and be submitted to the CBDS Program Director through the CBDS Program Coordinator.

1. A written request that includes a comprehensive description of the prior course detailing when and where completed, course semester credit hours, and details of course content and objectives.
2. An official copy of the student's transcript that indicates successful course completion and the grade issued.
3. A copy of the course description from the catalog that was in effect during the semester the course was taken.
4. A course syllabus is suggested but not required.

If the transfer of credit request is approved by the MSCI-TS COGS, the CBDS Program Coordinator will prepare a request for transfer of course credit (on GSBS form) and submit it to the GSBS for consideration/approval by the Dean. In no case will the allowable semester credit hour(s) of transfer for a given course exceed that of the corresponding CBDS course. No more than three (3) semester credit hours may be transferred towards the completion of a Certificate in Biomedical Data Science program.

Class Attendance and Make-up Policy

Attendance. The UT Health Science Center at San Antonio MSCI-TS faculty believe that attendance at scheduled classes and examinations is crucial to meeting course and program objectives. Therefore, regular attendance in class is expected of each student. Attendance is defined as being present within 15 minutes after the scheduled beginning of the class and until 15 minutes before the scheduled ending of the class.

Excused absences may be granted by the Course Director in cases such as formal presentations at scientific meetings, illness, or personal emergency. Excused absences are considered on an individual basis and require electronic communication with the Course Director to request an excused absence. The e-mail request to the Course Director for consideration of an excused absence must provide details regarding the circumstances and specific dates. It is expected that students will provide *advanced notice* of absence for scheduled events.

Repeated unexcused absences make it impossible to achieve course objectives. Thus, if a student has excessive unexcused absences in a given course, they will automatically receive a grade of *unsatisfactory* unless *makeup* has been approved by the Course Director (see below). Allowable unexcused absences will be determined by the credit hours of the course as follows:

Course (Semester Credit Hours)	Allowable Unexcused Absences
3	3
2	2
1	1

Absence Makeup. Makeup of absences (both excused and unexcused) is allowed at the discretion of the Course Director.

Other CBDS Program Requirements



Laptop Computers. The CBDS Program requires each student to have a laptop computer that can connect to and operate over a wireless network. Software required:

- Microsoft Office Suite (can be purchased at the UTHSCSA bookstore with a student ID)
- R & RStudio (Open source, free, latest version)
<https://www.rstudio.com/products/RStudio/>
<https://www.r-project.org/>

Laptops with an Apple Mac-based operating system must be able to also perform as a PC-based operating system.

All laptops will connect to The UTHSCSA network via the HSCwave broadcast wireless connection. Authentication for wireless use is based on The UTHSCSA domain username and password. Verification of proper operation **prior** to the start of class is highly recommended.

Assistance is available thru the IMS Service Desk (210-567-7777 or ims-servicedesk@uthscsa.edu). Assistance is also available at the IMS Student Support Center (4.421T, DTL).

Ethics/Professionalism Policy

The CBDS Program expects all students to exhibit the highest standards of conduct, honesty, and professionalism. Academic misconduct includes activities that undermine the academic integrity of the institution. The University may discipline a student for academic misconduct as outlined in the UT Health Science Center at San Antonio [Catalog](#) and [Handbook of Operating Procedures](#). Academic misconduct may involve human, hard-copy, or electronic resources. Policies of academic misconduct apply to all course-, department-, school-, and university-related activities including conferences and off-campus performances. All cases of academic misconduct must be reported to the Dean of the Graduate School of Biomedical Sciences (GSBS) and the seriousness of the violation may be taken into account in assessing a penalty. Academic misconduct includes, but is not limited to, the following:

- **Cheating.** Any attempt to use or provide unauthorized assistance, materials, information, or access in any form and in any academic exercise or environment is considered cheating and is expressly forbidden.

- ***Fabrication.*** A student must not falsify or invent any information or data including, but not limited to, records or reports, data analyses, and citation to the sources of information.
- ***Plagiarism.*** Plagiarism is defined as presenting someone else's work as one's own. Ideas or materials taken from another source for either written or oral use must be fully acknowledged. The adoption or reproduction of ideas, opinions, theories, formulas, graphics, or research results of another person without acknowledgment is expressly forbidden. Credit must be given to the originality of others whenever:
 - Quoting the works of another
 - Using another person's ideas, opinions, or theories
 - Paraphrasing the words, ideas, opinions, results, or theories of others
 - Borrowing facts, statistics, or illustrative material
 - Offering materials assembled or collected by others

Facilitating Academic Dishonesty. A student must not intentionally or knowingly help another student commit an act of academic misconduct, nor allow another student to use his/her work or resources to commit an act of misconduct.

Completion of the CBDS Program

Recommendation for Granting the Certificate in Biomedical Data Science. A graduate student must be accepted into in the CBDS program to be eligible to receive a certificate. Upon satisfactory completion of all required didactic and elective coursework, the CBDS student will complete and submit the CBDS Request for Certification form to the Academic Coordinator for review and approval by the MSCI-TS COGS. Once approved by the MSCI-TS Chair and COGS, the Chair will then submit a recommendation form to the *Graduate Faculty Council* (GFC) of the Graduate School of Biomedical Sciences (GSBS) through the Dean of the GSBS for further consideration and approval.

Time-to-Certificate. The CBDS Program can be completed within 1 year of study. Some students may require two (2) to three (3) years to complete certificate requirements. If a CBDS student has not completed the necessary coursework within three (3) years, the MSCI-TS COGS Chair will form a special committee to review progress with the student. The special committee's responsibility will be to either recommend a course of action to expedite completion or recommend termination of the enrollment of the student in the program.

Helpful Online Links

[Certificate in Biomedical Data Science \(CBDS\) Program](#)

[CBDS Forms](#)

[CBDS Course Schedules](#)

[Graduate School of Biomedical Sciences \(GSBS\)](#)

[GSBS Application for Admission](#)

[GSBS Academic Calendar](#)

[GSBS Syllabus Depot](#)

[CANVAS](#)

[UTHSCSA Catalog](#)

[UTHSCSA Handbook of Operating Procedures \(HOP\)](#)

[Office of Research Educating and Mentoring](#)

[Institute for the Integration of Medicine and Science](#)

Appendices

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2020-2021 Committee on Graduate Studies

Helen P. Hazuda, PhD
MSCI-TS COGS Chairman

Alex Bokov, PhD Population Health Sciences	Helen P. Hazuda, PhD Medicine/Renal Diseases
Carrie Jo Braden, RN, PhD Nursing	Teresa Johnson-Pais, PhD Urology
Andrew Cap, MD, PhD, FACP Clinical Investigation Fellowship San Antonio Military Medical Center	Addanki Pratap Kumar, PhD Molecular Medicine
Bandana Chatterjee, PhD Molecular Medicine	Donna M. Lehman, PhD Medicine/Cardiology
Byeongyeob Choi, PhD Population Health Sciences	Kelly C. Lemke, DDS, MSCI-TS Developmental Dentistry
Yong-Hee P. Chun, DDS, MS, PhD Periodontics	Timothy D. Raabe, PhD Graduate School for Biomedical Sciences
Robert A. Clark, MD Office of the VP for Research	Pamela Sabrsula, MS, CIP IRB
Bertha E. Flores, PhD, APRN School of Nursing	Susanne Schmidt, PhD Population Health Sciences
Christopher Frei, PharmD, MSc Pharmacology Ed& Research Cntr	Joseph O. Schmelz, PhD Office of the VP for Research
Jonathan Gelfond, MD, PhD Population Health Sciences	Rudy J. Trevino, MS, CPIA Research Regulatory Program
Goutam Ghosh-Choudhury, PhD Medicine/Renal Diseases	Chen-Pin Wang, PhD Population Health Sciences

CBDS Program Schedule

Year 1 – Fall Semester

TSCI 5070 (2 SCH) – Responsible Conduct of Patient Oriented Clinical Research
TSCI 5201 (3 SCH) – Advanced Statistics for Machine Learning Methods
TSCI 5230 (3 SCH) – Programming for Biomedical Data Science
CSAT 6005 (1 SCH) – Rigor & Reproducibility

Year 1 – Spring Semester

TSCI 6201 (1 SCH) – Data Science Leadership in Healthcare
TSCI 6202 (2 SCH) – Data Visualization and Real-Time Analytics
TSCI 6203 (1 SCH) – Practicum in Biomedical Data Science
TSCI/GSBS Electives (3 SCH) – TBD

CBDS Elective Courses (may be taken in any semester when offered)

TSCI 5050 (1 SCH) – Introduction to Data Science
TSCI 5073 (1 SCH) – Integrating Molecular Biology with Patient Oriented Clinical Research
TSCI 5074 (2 SCH) – Data Management, Quality Control, and Regulatory Issues
TSCI 5075 (2 SCH) – Scientific Communications
TSCI 5077 (1 SCH) – Practicum in Translational Science
TSCI 5080 (1 SCH) – Practicum in Integrat Molec Biology with Pt-Orient Clinical Research
TSCI 6060 (2 SCH) – Patient Oriented Clinical Research Methods -2
TSCI 6061 (2 SCH) – Patient Oriented Clinical Research Biostatistics -2
TSCI 6065 (2 SCH) – Health Services Research
TSCI 6066 (1 SCH) – Instrument Development and Validation
TSCI 6067 (1 SCH) – Genomic Healthcare
TSCI 6100 (1 SCH) – Practicum in IACUC Procedures
TSCI 6101 (1 SCH) – Topics in Translational Science
TSCI 6102 (1 SCH) – Practicum in IRB Procedures

Sixteen (16) semester credit hours (SCH) are required to obtain the Certificate in Biomedical Data Science (CBDS). Students **must** be admitted to the CBDS Program to be eligible for certification.

CBDS Tuition and Fees Breakdown

Certificate in Biomedical Data Science = Completion of 16 SCH Coursework (13 Required/3 Elective).

UTHSA Faculty/Staff with Private/Employer Health Insurance - TX Resident – Full Time Student Estimated Cost of Degree					
Semester	SCH	Tuition per SCH	Fees per Semester	Estimated Cost per Semester	Notes
Fall 2021	9	\$179.94	\$612.50	\$2,231.96	
Spring 2022	7	\$179.94	\$712.50	\$2,235.58	Includes \$100 Graduation Fee
Estimated Total Cost of Certificate				\$4,467.54	

TX Resident – Full Time Student Estimated Cost of Degree					
Semester	SCH	Tuition per SCH	Fees per Semester	Estimated Cost per Semester	Notes
Fall 2021	9	\$179.94	\$1,836.50	\$3,455.96	
Spring 2022	7	\$179.94	\$1,936.50	\$3,196.08	Includes \$100 Graduation Fee
Estimated Total Cost of Certificate				\$6,652.04	

Non-TX Resident – Full Time Student Estimated Cost of Degree					
Semester	SCH	Tuition per SCH	Fees per Semester	Estimated Cost per Semester	Notes
Fall 2020	9	\$679.07	\$1,836.50	\$7,948.13	
Spring 2021	7	\$679.07	\$1,936.50	\$6,689.99	Includes \$100 Graduation Fee
Estimated Total Cost of Certificate				\$14,638.12	

Estimated Fees Per Semester W/GSBS Health Ins = \$1,836.50

Note: Estimate includes: Fitness Center, Student Service, Medical Service, Library, GSBS Health Insurance Fees (\$1,224.00)

Texas Resident Tuition per Semester Credit Hour (SCH) = \$179.94

Non-Texas Resident Tuition per Semester Credit Hour (SCH) = \$679.07

Note: Estimated tuition is a combination of: Statutory, Differential, Designated, and Designated (Deregulated) Tuition Fees

Tuition and Fees subject to change without notice.

[Press CNTRL + Click Here for a detailed breakdown of Tuition and Fees.](#)

For questions regarding UTHSA Tuition and Fees Policy,

[Press CNTRL + Click Here for explanation of tuition types and fees.](#)

[Press CNTRL + Click Here for All CBDS Forms](#)

Certificate in Biomedical Data Science (CBDS) Program

CHECKLIST OF REQUIRED DOCUMENTATION FOR APPLICATION

See CBDS Handbook at
https://iims.uthscsa.edu/ed_certificate_in_bds_handbook
for full program requirements

- Submit an on-line application to the UT Health San Antonio Graduate School:
<http://gsbs.uthscsa.edu/>
- Official transcripts of ALL foreign colleges/universities from an approved NACES member [foreign credentialing evaluation agency](#) should be sent from the credentialing agency (in a sealed envelope) to The UTHSCSA Registrar's Office as directed in the on-line application instructions. The translation must be from an approved NACES member which has been approved by the UTHSCSA Registrar's Office.
- Official translation of foreign transcripts including GPA of ALL foreign colleges/universities from credentialing agencies should be sent from the credentialing agency (in a sealed envelope) to The UTHSCSA Registrar's Office as directed in the on-line application. The translation must be from a credentialing agency approved by the UTHSCSA Registrar's Office.
- Three Letters of Recommendation (LOR) should attest to the applicant's readiness for graduate level studies in biomedical data science and be addressed to Dr. Jonathan Gelfond, CBDS Program Director. *If a matriculated graduate student has a Supervising Professor or Program/Track Director, one letter must be provided by this individual.*

(Note: LOR's should be uploaded to your on-line application by the references you named in your on-line application.)

- LOR1 –
Reference: _____
- LOR2 –
Reference: _____
- LOR3 –
Reference: _____

- Test of English as a Foreign Language (TOEFL) or the academic version of the Test of English as a Foreign Language (IELTS) scores (test taken within the past two years) sent directly to The UTHSCSA from the ETS. UTHSCSA code: 6908 (Note: The TOEFL or IELTS (academic version) is required for all non-US citizens whose first language is not English.)
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[In addition to the above, the documents listed below are required and should be uploaded to your online application.](#)

- Curriculum vitae (CV) of applicant.
- Statement of Purpose (Includes a brief description of the applicant's educational background, long term career goals, and an indication of the basis for application into the CBDS Program.)

Certificate in Biomedical Data Science (CBDS) Program Student Program Status Checklist

The information contained below is subject to change at the Program's and/or Instructor's discretion without notice.

<u>Course Catalog Number & Title</u>	<u>Semester Course Schedule</u>	<u>Pre-Reg</u>
<u>YEAR 1 (FALL SEMESTER):</u>		
TSCI 5070 (2.0 sch): Responsible Conduct of Research	Mondays, 3-5 p.m.	---
TSCI 5201 (3.0 sch): <i>Adv. Stats for Machine Learning Methods</i>	Tues/Thurs, 9 - 10:30AM	---
TSCI 5230 (3.0 sch): <i>Programing for Biomedical Data Science</i>	Wednesdays, 2-5 p.m.	---
CSAT 6005 (1.0 sch): <i>Rigor & Reproducibility</i>	Mon/Wed, 9-11AM	---

YEAR 1 (SPRING SEMESTER):

TSCI 6201 (1.0 sch): <i>Data Science Leadership in Healthcare</i>	TBA	---
TSCI 6202 (2.0 sch): <i>Data Visualization and Real-Time Analytics</i>	TBA	---
TSCI 6203 (1.0 sch): <i>Practicum in Biomedical Data Science</i>	TBA	---
Electives (3.0 sch): TBD		
<i>Submitted Certification Request Form to Program (16 sch are required for CBDS Program Graduation)</i>		

<u>CBDS Program Electives Course Catalog Number & Title</u>	<u>Semester Course Schedule</u>	<u>Pre-Reg</u>
TSCI 5050 (1.0 sch): Introduction to Data Science	All Semesters	---
TSCI 5073 (1.0 sch): Integrat Molec Bio w/Pt Orient Clin Res	Spring Semester	---
TSCI 5074 (2.0 sch): Data Mgmt, Quality Control & Reg Issues	Spring Semester Tuesdays, 3-5 p.m.	---
TSCI 5075 (2.0 sch): Scientific Communication	Fall Semester Wednesdays, 3-5 p.m.	---
TSCI 5077 (1.0 sch): Practicum in Translational Science	All Semesters (TBA)	---
TSCI 5080 (1.0 sch): Practicum in Integrat Molec Bio w/Pt-Orient Clin Res	Fall Semester (TBA)	TSCI 5073
TSCI 6060 (2.0 sch): Pt Oriented Clinical Research Methods – 2	Spring Semester Mondays, 3-5 p.m.	TSCI 5071
TSCI 6061 (2.0 sch): Pt Oriented Clinical Research Biostats – 2	Spring Semester Thursdays, 3-5 p.m.	TSCI 5072
TSCI 6065 (2.0 sch): Health Services Research	Fall Semester Thursdays, 3-5 p.m.	TSCI 5071 TSCI 6060
TSCI 6067 (1.0 sch): Genomic Healthcare	Spring Semester Wednesdays, 3-5 p.m.	---
TSCI 6069 (2.0 sch): Statistical Issues, Planning & Analysis of Contemporary Clinical Trials	Spring Semester (TBA)	TSCI 5072 TSCI 6061
TSCI 6070 (2.5 sch): Biostatistics Methods for Longitudinal Studies	All Semesters Wednesdays, 1-4 p.m.	TSCI 5072 TSCI 6061
TSCI 6100 (1.0 sch): Practicum in IACUC Procedures	All Semesters Wednesdays (TBA)	---
TSCI 6102 (1.0 sch): Practicum in IRB Procedures	All Semesters Tuesdays (TBA)	---
TSCI 6105 (1.0 sch): Topics in Cancer Prevention	Fall Semester (TBA)	---
TSCI 6106 (.5 - 1.0 sch): Practicum in Cancer Prevention Science	All Semesters (TBA)	---

Certificate in Biomedical Data Science (CBDS) Program
Certification Request Form

Student Name: _____

Graduation Semester: Fall Spring

(Double Click on Box & Mark "Checked")

Year: _____

Regular UTHSA Graduate Student: Yes No

If yes, graduate program/track _____

Department/Division: _____

Date admitted to CBDS Program: _____

Courses completed towards a Certificate in Biomedical Data Science

Course ID Number	Course Title	Course Semester Credit Hours (SCH)	Yr/semester completed

Signature confirms course information above:

Approved for Submission to MSCI-TS COGS for
Graduation Recommendation:

Academic Programs Coordinator (Date)

CBDS Program Director (Date)

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