

MINORS OFFERED AT HABIB UNIVERSITY



**OFFICE OF UNDERGRADUATE EDUCATION &
ACCREDITATION**

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Minors Offered at Habib University

What is a Minor?

Modern education is primarily centered on training individuals to succeed in focused fields of specialization, but in a world with constantly changing dynamics, it is no longer realistic to confine yourself to an isolated field of specialization. Minors are a way for you to graduate with more than one area of specialization, and due to the interdisciplinary nature of Habib University's major and minor programs, skills learned in both types of specializations can be used interchangeably.

Minors are an integral part of the Liberal Arts and Sciences educational experience at HU as they allow you to explore your interests, personalize, and diversify your undergraduate programs.

This unique academic experience will help you develop a critical understanding of the world you live in by giving you the opportunity to engage with, think critically about, and be able to solve the complex problems of today.

The Benefits of Taking a Minor

All HU students, regardless of major, can expand their fields of specialization by taking an optional minor program to supplement their major program. Minors help in honing a variety of skills including the capacity to engage in intellectual and scientific inquiry. The advantages vary, as each individual specialty will give you a unique perspective in the way you perceive and exist in the world today.

Graduating with a minor has many advantages, including:

- A chance to pursue a wide range of post-graduate degree programs, dependent on your major-minor combination
- The ability to qualify for an expansive range of career options due to a uniquely specialized degree program
- The development, and utilization, of a variety of interdisciplinary skill-sets that will help students in your future entrepreneurial and academic endeavors

Minors expand students' future possibilities and allow them to graduate with a honed interdisciplinary focus. An interdisciplinary approach towards society's complex social, political and scientific problems will allow students to solve modern day problems using innovative.

List of Minors offered at Habib

S. No	Minors	Offered by	Offering School	No of Courses	Credit Hours ⁺
1	Comparative Literature	Comparative Humanities (CH) Program	SAHSS	6	18
2	Philosophy			5	15
3	Religious Studies			5	15
4	History			5	15
5	South Asian Music	South Asian Music Center & CH Program		5*	15*
6	Communication and Design	CND Program		5	15
7	Social Development & Policy	SDP Program		5	18
8	Physics	ISciM Program	DSSE	7**	20
9	Mathematics			7	20
10	Computer Science	CS Program		7	21
11	Electrical and Computer Engineering	ECE Program		8	22

⁺ minimum credit hours required.

*South-Asian music minor – an additional 3 semesters of Practicum in the Music room are required.

**Physics minor – in addition to the 7 courses, 2 lab courses are also to be taken to fulfill the foundational requirement.

Minors Offered by the School of Arts, Humanities and Social Sciences

1a. Comparative Literature (CL) Minor

Offered by: Comparative Humanities (CH) Program

The minor in comparative literature will feature a range of courses explaining how world literatures have adapted to, and been transformed by the rise of English as a global medium for literary production. The aim of the minor is to introduce students to multiple ways to analyze texts and produce a theoretically informed interpretation of several texts and traditions in dialogue. It will enable students to work comparatively and fluidly with texts and read, write, and think critically, creatively, and imaginatively. This makes Comparative Literature compelling for both graduate schools across the human and social sciences and employers across a range of sectors of the economy.

Learning Outcomes:

- Locate major writers in English, Urdu, and World Literature within their respective linguistic, cultural, and historical periods.
- Define and discuss the evolution of themes, styles, and techniques across genres and within traditions.
- Work comparatively and fluidly with texts in translation and in conversation with their respective linguistic and cultural milieux.
- Explain how world literatures have adapted to, and been transformed by, the rise of English as a global medium for literary production.
- Analyze texts closely using methods appropriate to literary analysis and translation studies.
- Critically assess conceptual problems integral to the nature of literary and aesthetic experience.
- Produce a theoretically informed interpretation of several texts and traditions in dialogue.
- Read, write, and think critically, creatively, and imaginatively.

Eligibility criteria (if any):

All Habib University students from all majors except those majoring in CH program are eligible to declare and pursue the CL Minor.

Credits required

18 - 20

Courses required:

06 (see details below)

a. Core Courses (3)

1. What is World Literature (WiWL) formerly known as RWTL (or another course that satisfies the requirement, as recommended by the CH-PBoS and approved by the BoF, such as, LIT 107: Dystopian, Apocalyptic, & Post-Apocalyptic Novels in Spring 2021, OR LIT 233: Prose Poem in Fall 2020).

2. LIT 225: Intro to Literary Theory and Criticism.
3. CORE 121: Jehan-e-Urdu (a required Habib Liberal Core course).

b. Elective Courses (2) - Upper Division LIT Electives:

4. A 300/400 level LIT course
5. A 400 level LIT course

c. Elective in Comparative Humanities (1): (3 or 4 credits)

One Comparative Humanities elective at any level, that is, one course in the area of HUM or HIST or LIT or PHIL or RELS or MUS relevant to the student's area of concentration, which could be either South Asian Literature, World Literature, or a mixed configuration of the two. Habib Liberal Core courses cannot be used to fulfill requirements for category 'c'.

NB:

No single Habib Liberal Core course can count towards fulfilling requirements towards completion of more than one of CL, HIST, RELS, and PHIL Minors

1b. English and Comparative Literature (ECL) Minor for Classes of 2021 & 2022 only

Offered by: Comparative Humanities (CH) Program

Eligibility criteria (if any):

Students of Classes of 2021 and 2022 are eligible to declare and pursue the ECL Minor.

Total number of courses required for the Minor:

06 courses

Credits required:

20 credit hours

Details of the Courses

- **ECL Required Course (1)** What is World Literature (WiWL) formerly known as RWTL (or another course that satisfies the requirement, as recommended by the CH-PBoS and approved by the BoF, such as, LIT 107: Dystopian, Apocalyptic, & Post-Apocalyptic Novels in Spring 2021, OR LIT 233: Prose Poem in Fall 2020, OR LIT 225: Intro to Literary Theory and Criticism).
- LIT Electives Any Level – **(3)**
- LIT Upper Division (300 – 400 Level) electives – **(2)**

Other Details:

- **Credit Hour Count Waiver:**

If a student has fulfilled the course requirements for the ECL Minor then the minimum 20 CH count requirement would be waived in favor of a range, amounting to between 18 and 20 CH.

- **Grade Requirements:**

Courses cleared with C minus / passing grade can be counted towards completion of the ECL Minor.

NB:

No single Habib Liberal Core course can count towards fulfilling requirements towards completion of more than one of ECL OR CL, HIST, RELS, and PHIL Minors

2a. Philosophy Minor

Offered by: Comparative Humanities (CH) Program

The study and practice of Philosophy is concerned with the re-organization of existing patterns of thought and the generation of new thought and concepts, directed towards the transformation of humans and their worlds. The minor gives students philosophical training that enables them to explore continuities between Philosophy and other aspects of their ongoing curricular, professional and personal experiences. Students completing the minor will have sufficient capacity to think and write about universal philosophical themes pertaining to ontology, epistemology, aesthetics, ethics, and politics.

The cognitive qualities of analytical, critical and synthetic power, as well as the power of conceptual innovation, that are all associated with the practice of philosophy make philosophical study attractive both for graduate studies, as well as for employers across a range of sectors of the economy.

Learning outcomes:

- Develop the capacity to engage in intellectual inquiry that runs in the circuit of existence, knowledge, conceptions of the human and the subject, and the history of Philosophy.
- Develop the capacity to raise, and to work through ethical questions, including questions in meta-ethics, applied and professional ethics and questions pertaining to the ethical implications of political thought.
- Develop the capacity to probe questions of philosophical methodology, that is, various forms of logic and dialectic in the history of Philosophy, and the role of mathematical thought in Philosophy.
- Develop the capacity for production and critique of knowledge production and practice in the various fields and disciplines of the Arts, Humanities, Social Sciences, and STEM.

Eligibility criteria (if any):

All Habib University students from all majors except those majoring in CH program are eligible to declare and pursue the Philosophy Minor.

Credits required:

15 – 20 credits

Courses required:

Total 05

a. **Core Courses (2)**

1. PHIL 200: What is Philosophy? OR PHIL 122 Introduction to Western Philosophy or Introduction to Philosophy, (or another course that satisfies the requirement i.e. recommended by CH-PBoS and approved by BoF).
2. Either Hikma 1, or, Formal Reasoning (meaning either CORE 111: Logical Problem Solving or CS 101: Programming Fundamentals), but not both.

b. Intermediate course *(1)

3. Either Epistemology or Ontology (if both are taken as separate courses, one counts as an advanced level elective, courses satisfying the requirement/s recommended by the CH-PBoS and approved by the BoF).

*For further clarity please note that intermediate level is broadly defined to include courses with codes ranging from 200 to 400, and which have sustained engagement with ontological and/or epistemological inquiry. **(See Annexure 'A' below for list of relevant courses, updated in September 2021)**

c. Advanced Level Electives (2)

4. Any two advanced level (300 or 400 level) electives in PHIL.

Annexure 'A'

Listing courses - taught in fall 2019 and onwards - that satisfy requirement b-3 for the minor:

S.No.	Course Code	Course Title
1	PHIL 324	The Oneness of Being: The Creative Imagination of Ibn 'Arabi
2	PHIL 325	Dream Interpretation: A Decolonial History
3	PHIL 375	Philosophy in the Anthropocene
4	PHIL/RELS 327	Spirituality, Philosophy and Science
5	PHIL/LIT 311	Philosophy, Literature, and the Question of Virtue
6	PHIL 326	Philosophical Hermeneutics
7	HUM/PHIL 301	Comparative Hermeneutics of the Self
8	PHIL/SDP 222	What is Power? Foucault, Biopolitics & Critical Thinking
9	PHIL/ECON 421	Philosophy of Marx

NB:

No single Habib Liberal Core course can count towards fulfilling requirements towards completion of more than one of ECL OR CL, HIST, RELS, and PHIL Minors

2b. Philosophy Minor (for the Class 2021 and 2022 only)

Offered by: Comparative Humanities (CH) Program

Eligibility criteria (if any):

All Habib University students in the batches of 2021 and 2022 are eligible to declare and pursue the Philosophy Minor.

Credits required:

20 credit hours

Courses required:

Total 05

Details of the Courses

The minor requires 20 credit hours in Philosophy. There is significant elective space and students are effectively designing substantial components of their minor, based on their interests. All requests pertaining to declaration of minor and trajectories towards completion of requirements are subject to approval by the Director of Comparative Humanities (CH).

The basic scheme for the minor is as follows:

- PHIL 200: What is Philosophy? OR PHIL 122 Introduction to Western Philosophy or Introduction to Philosophy, (or another course that satisfies the requirement/s and recommended by the CH-PBoS and the BoF).
- Either Hikma 1, or, Formal Reasoning (meaning either CORE 111: Logical Problem Solving or CS 101: Programming Fundamentals), but not both.
- Two advanced level (300 or 400 level) electives in PHIL.
- One PHIL elective at any level.

Other Details:

- Credit Hour Count Waiver for PHIL Minor

If a student has completed the required five-course sequence for the PHIL Minor, then the minimum 20 CH count requirement would be waived in favor of a range, amounting to between 16 and 20 CH.

Grade Requirements:

Courses cleared with C minus / passing grade can go on the grid for Philosophy Minor.

NB:

No single Habib Liberal Core course can count towards fulfilling requirements towards completion of more than one of ECL OR CL, HIST, RELS, and PHIL Minors

3a. Religious Studies Minor

Offered by: Comparative Humanities (CH) Program

The minor will feature a range of courses in comparative religion, theory and methods in the study of religion, textual analysis, and specialized topics in religious studies. The aim of the minor is to introduce students to multiple ways of approaching world religious traditions, and the ways in which these traditions have been shaped by historical, political, and social realities. Students will appreciate the plurality and richness of religious expression throughout history, and the modes in which religious traditions continuously interact. This makes Religious Studies compelling for both graduate school across the human and social sciences, as well as for employers across a range of sectors of the economy.

Learning Outcomes:

- Apply methods from several key disciplines in the social sciences and the humanities in the study of religion.
- Question notions of ‘mainstream’ religion, religious essentialism, and the immutability of religious traditions and their underlying moral frameworks
- Employ comparative approaches to understand the ways in which world religious traditions have influenced and shaped each other
- Explore the interface between religious, institutions, texts, ideas, and practice
- Critically reflect on the historical roots of contemporary conflicts that are popularly seen to be rooted in religious difference

Eligibility criteria:

All Habib University students from all majors except those majoring in CH program are eligible to declare and pursue the Religious Studies Minor

Credits required:

15 – 20

Courses required:

Total 05

a. Core Courses (2)

1. RELS 102: An Introduction to World Religions or RELS/HIST 223: The Making of Modern World Religions, or RELS/HIST 233 Religion in Modernity: Adaptation and Transformation
2. CORE 202: Hikma 1 – History of Islamic Thought (a required Habib Liberal Core course).

b. Intermediate course (1)

3. Theories and Methods in Religious Studies (or any course that satisfies the requirement by the CH-PBoS and approved by the BoF such as, RELS 223: Comparative Approaches, Methods and Key Issues in the Study of Religion in Spring 2021).

c. Electives (2)

Any Two Advanced level electives (300 or 400 level) in the area of RELS.

Note: the course CORE 302: Hikma II can be one of two electives for requirement 'c', provided the student is not already counting Hikma II for the second philosophical thought requirement in the Habib Liberal Core Curriculum.

NB:

No single Habib Liberal Core course can count towards fulfilling requirements towards completion of more than one of ECL OR CL, HIST, RELS, and PHIL Minors

3b. Religious Studies Minor (For the Classes of 2021 and 2022)

Minor offered by:

Comparative Humanities (CH) Program

Eligibility criteria:

All Habib University students in the batches of 2021 and 2022 are eligible to declare and pursue the Religious Studies Minor.

Credits required:

20 credit hours

Courses required:

Total 05

Details of courses required for the Minor:

- CORE 202: HIKMA I – History of Islamic Thought
- RELS/ HIST 223: The Making of Modern World Religions, OR RELS/HIST 233: Religion in Modernity: Adaptation and Transformation, OR RELS 223: Comparative Approaches, Methods, and Key issues in the Study of Religion.
- A minimum of two RELS courses at the upper (300 or 400) level are required.
- One RELS Elective at any Level.

Students may choose to do an upper-level independent study over one or two semesters. Its topic and plan of studies must be drawn up in consultation with the faculty member supervising the study and recommended by the CH-PBoS and approved by the BoF.

Independent studies must be approved, and the Office of the Registrar notified by submission of the approved Independent Study form, no later than the end of the Add/Drop course period of the semester, in which the study is to be undertaken.

Elective Courses:

Note: the course CORE 302: Hikma II can count as one of the two electives for the upper level (300 to 400 level) requirement, provided the student is not already counting Hikma II for the second philosophical thought requirement in the Habib Liberal Core Curriculum.

Other Details:

- **Credit Hour Count Waiver for RELS Minor**

If a student has completed the required five course sequence for the RELS Minor, then the minimum 20 CH count requirement would be waived in favor of a range, amounting to between 16 and 20 CH.

Grade Requirements:

Courses cleared with C minus / passing grade can go on the grid for Religious Studies Minor.

NB:

No single Habib Liberal Core course can count towards fulfilling requirements towards completion of more than one of ECL OR CL, HIST, RELS, and PHIL Minors

4a. History

Offered by: Comparative Humanities (CH) Program

History is regarded as an essential component of a liberal arts education. The aim of the minor is to awaken the student's curiosity about how the past shapes our present and to nurture the critical thinking, research, and writing skills that are essential for historical study. The minor will teach students to identify, understand and critically analyze historical change and difference, as well as the legacies, conscious or unconscious, that each generation inherits from its past, and the many perspectives and relations one can have vis-à-vis those legacies. The cognitive qualities of complexity, rigor, ability to recognize contingency and imagine alternatives, as well as, sensitivity to change and transformation in the midst of continuity make historical study attractive both for graduate school across the human and social sciences, as well as for employers across a range of sectors of the economy.

Learning Outcomes:

- Appreciate the interconnectedness of histories of various parts of the world.
- Critically analyze the historically crucial role of conceptual and discursive shifts and transformations across historical mentalities and spaces.
- Conduct historical research and craft arguments that resonate with diverse audiences
- Navigate historiographical debates, historical methodologies and interpretive frameworks

Eligibility criteria:

All Habib University students from all majors except those majoring in CH program are eligible to declare and pursue the History minor

Credits required:

15-20

Courses required:

Total 05

a. **Core Courses (2)**

1. Global Histories: 1500 to the Present (or another course that satisfies the requirement i.e. recommended by CH-PBoS and approved by BoF). Current list includes - Russian History or HIST 225: Latin American History or HIST/SDP 190: (Global Histories) Military Regimes in South Asia and South America or HIST 2xx: (Global Histories) Political Islam)
2. Pakistan and Modern South Asia (PAMSA – a required Habib Liberal Core course).

b. **Intermediate course (1)**

3. Historical Being, Being Historical: Historicity & Historical Method (or another course in Historiography/Theory of History/Methods in History/Philosophy of History such as HIST 227: Understanding Histories: Historiography and Historical Methods).

c. **Electives (2)**

4. Any two advanced level (300 or 400 level) HIST electives.

NB:

No single Habib Liberal Core course can count towards fulfilling requirements towards completion of more than one of ECL OR CL, HIST, RELS, and PHIL Minors

4b. History (For the classes of 2021 and 2022 only)

Offered by:

Comparative Humanities (CH) Program

Eligibility criteria (if any):

All Habib University students in the batches of 2021 and 2022 are eligible to declare and pursue the History Minor.

Credits required:

20

Courses required:

Total 05

Total number of courses required for the Minor:

- The 200 – level course, The Making of Modern World Religions, OR HIST 227: Understanding Histories OR HUM 200: World Historical Figures, Statesmen, Leaders, Authority: Arendt and Gandhi.
- CORE 201: PAMSA
- Any two HIST electives at advanced (300 or 400) level are required.
- Any one HIST elective at any level.

Students may choose to do an upper-level independent study over one or two semesters. Its topic and plan of studies must be drawn up in consultation with the faculty member supervising the study as recommended by the CH-PBoS and approved by the BoF, and the Office of the Registrar notified by submission of the approved Independent Study form no later than the end of the Add/Drop course period of the semester in which the study is to be undertaken.

Elective Courses

Free electives (but not program required courses) cross-listed as History in the major programs may be used to fulfil minor requirements. Students may count one course towards both the History minor and a Liberal Core requirement.

Other Details:

- **Credit Hour Count Waiver for HIST Minor**

If a student has completed the required five course sequence for the HIST Minor, then the minimum 20 CH count requirement would be waived in favor of a range, amounting to between 16 and 20 CH.

- **Grade Requirements:**

Courses cleared with C minus / passing grade can be counted towards completion of the History Minor.

NB:

No single Habib Liberal Core course can count towards fulfilling requirements towards completion of more than one of ECL OR CL, HIST, RELS, and PHIL Minors

5. South Asian Music

Offered by: Center for South Asian Music & Comparative Humanities (CH) Program

The minor in South Asian Music at Habib University will provide an opportunity for students to explore the field of Music and engage with their South Asian musical heritage through courses exploring the evolution and theoretical basis of South Asian music, contrasting them with other musical traditions and genres. The minor will offer courses that introduce basic musical theory, explore the scientific and mathematical frameworks of music, locate South Asian music in its historical and social contexts, and establish a

foundation for pursuing advanced studies in music. Some courses for the minor will require students to learn a particular musical skill (instrumental, vocal or compositional). The practice component of the minor will be fulfilled by enrolling in music tutorials for three semesters.

Learning Outcomes:

- Recognize and distinguish between, various forms of musical performance (*e.g. dhrupad, khayal, thumri, kafi, kajri, dadra etc.*) and musical structures (*e.g. raags, taals, gats etc.*).
- Identify the properties of the twelve-tone scale and its usage in Western and South Asian music and apply techniques (both rhythmic and melodic) to generate rudimentary musical sounds.
- Articulate the mathematics inherent to musical forms and the mathematics used to generate musical ideas
- Accurately describe the social and historical contexts in which South Asian music has evolved and explain the global music context in which it currently stands.
- Assess, ethnographically, the system of South Asian music, its practitioner communities and audience, and use it as a lens for understanding the historical and contemporary socio-political landscape of the region.

Eligibility criteria:

Students from all programs at Habib University can take the South Asian Music Minor

Credits required:

15 Credits (minimum)

Courses required:

5 Courses (3 credits each) and 3 Semesters of enrollment in the Music Room Lessons

Details of the Courses

a. Core Courses (4)

- Music of South Asia: Styles and Structures (MUS 101) - 3 Credits
- Music and Mathematics (MATH 106) – 3 Credits
- Sound and Subjectivity (MUS 222) – 3 Credits
- Humari Meeras: History and Discourse in South Asian Music (MUS 221) – 3 Credits

b. Elective Course: (01)

One elective course in either History, Theory or Practice. The courses that currently qualify for such an elective are:

- Introduction to Pakistani Film Music (LIT 121) – 3 Credits
- Breathing Bansuri (MUS 111) – 3 Credits
- Musicking: The Anthropology of Music (ANT 2XX) – 3 Credits
- The Science of Sound – 3 Credits

c. Other:

Three semesters of practicum in Music Lessons offered at the Khawaja Mashooqullah Music Room, offered through the Centre for South Asian Music. Students declaring a South Asian Music Minor will be required to get attestation from the Music Room Manager and the Center Director in their final semester at Habib and will receive a certificate of completion of the three-semester practicum from the Center for South Asian Music. This requirement is in addition to the requirement for Music Room enrolment for MUS 101 (a course requirement).

Note

The student must meet at least two times a week for a 45-minute session with the instructor and must also carve out time for daily practice. Practicum is handled by the Centre for South Asian Music.

Grade Requirements:

The student should have a C+ or higher grade in all the 5 courses.

6. Communication & Design Minor

Offered by: Communication and Design (CND) Program

Communication and Design has multiple intersections with all majors currently offered at Habib. The minor trains students to be critical observers of the visible world and helps them communicate their observations with clarity and insight. Coursework develops students' abilities through a combination of theoretical engagement and studio practice and teaches students how to move meticulously from an idea to its materialization. Students completing a CND minor will be better equipped to offer unique solutions to contemporary issues facing Pakistan by being able to address professional and intellectual challenges from a design point of view and to communicate strategies that are easier to implement.

Learning Outcomes:

- Understand how various media operates to shape our understanding of an interaction with the world around us
- Apply design thinking to solve critical issues facing Pakistan and the world
- Innovate creative solutions to the 'Wicked problems' within students' home discipline.

Eligibility criteria:

All Habib University Students from all majors except those majoring in CND program can pursue the minor.

Credits required: 15 (minimum)

Courses required: 05

Details of courses:

One of Either:

- CND 105: Shaping Modernity (Pre-Fall 2021) (4 credit hours)
- CND 105: Forms of Inquiry (For Spring 2022) (2 credit hours) / CND 106 (Pre-Fall 2021): Forms of Inquiry (4 credit hours)
- COM 202: Communication and Culture (2 credit hours)/CND 126 (Pre-Fall 2021): Communication and Culture (3/4 credit hours)
- COM 209: Thinking Media (2 credit hours)/CND 226: Thinking Media (3/4) credit hours

One of Either:

- CND 311: Elements of Aesthetics (3 or 4 credit hours) or COM 204: Elements of Aesthetics 1 (3 credit hours)
- CND 301: Transdesign Practicum (4 credit hours) or DES 203: Designing for and with People (4 credit hours)

Minimum **03** CND, COM or DES electives (9-12 credit hours)

For Class of 2021 & below:

Credits required: 15 (minimum)

Courses required: 05

Details of courses:

- All students pursuing the minor must complete any one of the following courses listed below:

Course Code	Course Title
CND 105	Shaping Modernity
CND 106	Forms of Inquiry
CND 126	Communication & Culture

- Students must also complete any one of the following courses:

Course Code	Course Title
CND 301	Trans Design Practicum
CND 311	Elements of Aesthetics

- The remaining (3) minor requirements are met through CND program electives. All CND minors are strongly advised to complete at least (1) studio-based course.

7. Social Development and Policy Minor

Offered by: Social Development and Policy (SDP) Program

Eligibility criteria:

Students from all programs from all majors except those majoring in SDP program at Habib University can take the SDP Minor.

Credits required:

18 credit hours (minimum)

Courses required:

05 courses

Details of courses:

To earn a minor in SDP, students must successfully complete following courses:

1. SDP 101 - Development and Social Change
2. SDP 201 -Qualitative Research Methods (QRM1) or SDP 202 - Quantitative Research Methods (QRM2)
3. SDP 204 - Public Policy I or SDP 301 - Public Policy*
4. One SDP Elective at any level
5. One SDP elective at an upper-level (300 or 400).

**The course has been discontinued after Spring 2022.*

Minors offered by Dhanani School of Science and Engineering

8. PHYSICS

Offered by: Integrated Sciences and Math (iSciM) Program

The Physics minor is designed to open the opportunity for students with a significant interest in physics to deepen their understanding of the subject. This will provide a foundation for a broader range of technical fields, enhancing their ability to keep abreast of an ever-changing technological world.

Eligibility criteria:

Students from all programs at Habib University can take the Physics Minor.

Courses required:

Students must take all foundational courses (04 courses & 2 labs) specified in below table with (03) additional courses of 300 or higher level to qualify for the Physics minor.

Credits required:

20 credits (minimum)

Details of the Courses

a. Core Courses (List of 4 courses and 2 labs) – 14 credit hours

Foundational Courses	Credit Hours	Pre-requisite(s)
PHY 101-Mechanics and Thermodynamics (Course 1)	3	None
PHY 201-Modern Physics (Course 2)	3	PHY 101-Mechanics and Thermodynamics
PHY 202-Quantum Mechanics (Course 3)	3	PHY 201-Modern Physics and PHY 101-Mechanics and Thermodynamics
PHY 241-Electromagnetic Theory (Course 4)	3	MATH 202-Engineering Mathematics or equivalent
PHY 101L-Mechanics & Thermodynamics Lab (Lab 1)	1	PHY 101-Mechanics and Thermodynamics
PHY 102L-Advanced Physics Lab (Lab 2)	1	PHY 101L-Mechanics & Thermodynamics Lab

b. Elective Courses: (Electives offered by the program that can fulfil the minor requirements) – a minimum of 3 courses and 6 credit-hours required

Elective Courses	Credit Hours	Pre-requisite(s)
ME 432-Introduction to Nanotechnology	3	PHY 201, PHY 202
PHY 301-Classical Mechanics	3	MATH 101, MATH 102
PHY/MATH 302- Mathematical Methods for Physics (also valid for Mathematics Minor)	3	MATH 101, MATH 102, MATH 202, MATH 205
PHY 351-Introduction to Statistical Mechanics	3	PHY 101, MATH 101, MATH 102, MATH 202
PHY 401-Quantum Mechanics II	3	PHY 202
PHY 441/EE 441-Antennas and Wave Propagation	3	EE 241
PHY 360/ME 302-Engineering Thermodynamics	3	PHY 101, MATH 101
PHY 300/CS 314-Quantum Computing	3	MATH 113, MATH 205, CS 102

Note:

1. The offering of electives is subject to the availability of faculty and is contingent on the number of students enrolled.
2. A minimum of seven (07) students are required to offer a course. In case fewer students enroll, individual study courses may be offered by the program subject to the availability of relevant faculty.
3. Students must earn a minimum of 20 credits.

Grade Requirements:

Students must earn a C grade or higher in all *mandatory* courses (foundation courses) to continue with the minor.

9. MATHEMATICS

Offered by: Integrated Sciences and Math (iSciM) Program

The mathematics’ minor at Habib University offers an opportunity to students from all disciplines with a significant interest in mathematics to develop strong foundations in key areas of mathematics. This optional field of study is designed to provide a foundation in

Calculus, Linear Algebra, and basic modelling techniques using differential equations. Convergent thinking is also developed through the analysis of quantitative problems directed towards the right procedure for the right outcomes. The choice of courses available within the minor allows the students to take either a pure mathematics track, an applied mathematics track or a mix of the two.

Eligibility criteria:

Students from all programs at Habib University can take the Mathematics Minor.

Courses required:

07 courses

Students must take (04) foundational courses specified in below table and (03) additional courses with at least two of them of 300 or higher level to qualify for the mathematics minor.

Credits required:

20 credits (minimum)

Details of the Courses

a. Core Courses (List of courses with course names and credits)

Foundational Courses	Credit Hours	Prerequisite(s)
MATH-102 Calculus II	3	MATH-101 Calculus I
MATH-202 Engineering Mathematics	3	MATH-101 Calculus I
MATH-205 Linear Algebra	3	MATH-202 Engineering Mathematics
MATH-310/EE-354 Probability and Statistics	3	None

b. Elective Courses: (Electives offered by the program that can fulfil the minor requirements)

- MATH 101 - Calculus I (Only for SAHSS students)
- MATH 106 - Music and Mathematics
- MATH 104 - History of Mathematics
- MATH 105 - The Art of Mathematics
- MATH 113/CS 113 - Discrete Mathematics
- MATH 320/CS 326 - Mathematics of Machine Learning
- MATH 413/CS 413 - Graph Theory
- PHY/MATH 302 - Mathematical Methods for Physics

Note:

1. Math 0xx level courses cannot be taken to satisfy the minor.
2. DSSE students have a mandatory requirement of MATH 101 but it cannot be double counted towards the minor.
3. SAHSS students can count MATH 101 towards the minor.
4. Students are free to choose electives either from Pure Mathematics or Applied Mathematics or both.
5. Depending on the availability of the faculty, a variety of courses can be offered within Pure and Applied Mathematics. Please check with the program at the start of the academic year for the latest list of elective offerings.
6. A minimum of seven (07) students is required to offer a course. In case fewer students enroll, individual study courses may be offered by the program subject to the availability of relevant faculty.
7. Students must earn a minimum of 20 credits.

Grade Requirements:

Students must earn a C grade or higher in all mandatory courses (foundational courses) to continue with the minor.

10. Computer Science

Offered by:

Computer Science (CS) Program

Eligibility criteria:

Habib University students from all majors except those majoring in CS are eligible for the CS Minor and they can double-count at most 4 required courses or program electives to fulfill their CS minor.

Note: The double-counting of a maximum of 4 required courses or program electives is applicable from the Class of 2025 & onwards (only) towards both the student's major and the CS minor.

Credits required:

21 credit hours (minimum)

The exact number of credit hours will depend on the nature of individual courses i.e., courses with/without a lab component.

Courses required:

Total 07

Course or Course Category	Credit Hours	Prerequisite(s)/ Corequisite(s)
CS Foundation: (All 3 Courses)		
CS 101: Programming Fundamentals	2+1	None
CS 113: Discrete Mathematics	3	None
CS 201: Data Structures and Algorithms	3+1	None
CS Kernel: Two 200 or higher-level courses from CS Kernel		
CS201: Data Structures II	3	CS-113 DM
CS224: Object Oriented Programming	3+1	CS-101Pfun & CS-201 DSA
CS212: Nature of Computation	3	None
CS232: Operating Systems	3+1	CS-101Pfun & CS-201 DSA
CS355: Database systems	3+1	CS-101Pfun & CS-201 DSA
CS412: Algorithms: Design and Analysis	3	
CS353: Software Engineering	3	
CS Elective: (Any 2 Courses)		
CS 2XX		None
CS 3XX		None
CS 4XX		None

Instructions:

1. Before enrolling in any course for the CS minor, student must have obtained a passing grade in the respective pre-requisite course.

2. Two 300 or higher-level CS courses: any CS elective with CS 2xx, CS 3xx and CS 4xx course numbers will qualify. Also, courses (300 level and above) offered by other programs that are approved, can be counted as CS electives that can be taken. These CS Electives can be either 3 or 4 credit hour courses.

List of CS Electives:

- i. CS 261 Understanding Social Networks
- ii. CS 262 Computational Social Science
- iii. CS 311 Introduction to Cryptography
- iv. CS/PHY 314 Quantum Computing
- v. CS 316 Introduction to Deep Learning
- vi. CS 324 Advanced Java Programming
- vii. CS 326 Mathematics of Machine Learning
- viii. CS 336 Introduction to Computer Security
- ix. CS 361 Social Network Analysis
- x. CS 363 Networks, Games and Collective Behavior
- xi. CS 342 Game Development
- xii. CS 351 Artificial Intelligence
- xiii. CS 370 Web and Mobile Development
- xiv. CS 371 Software Security
- xv. CS 400 Senior Seminar
- xvi. CS 421 Compiler Construction
- xvii. CS 440 Computer Graphics
- xviii. CS 446 Applied Digital image Processing
- xix. CS 451 Computational Intelligence
- xx. CS 457 Data Science Techniques
- xxi. EE 366 / CS 380 Introduction to Robotics
- xxii. EE 375 Micro controllers and interfacing
- xxiii. EE 424 Data Communication and Networking
- xxiv. EE 452 Computer Vision
- xxv. EE 427 Cellular Internet of Things in 5G
- xxvi. EE 451 Digital Image Processing

Brief guide for CS Minor:

CS Foundation (3 courses)

- CS 101 Programming Fundamentals
2+1, offered throughout the year
requires: none
- CS 102 Data Structures and Algorithms
3+1, offered mostly in Spring semester
requires: none
- CS 113 Discrete Mathematics
3+1, offered mostly in Spring semester
requires: none

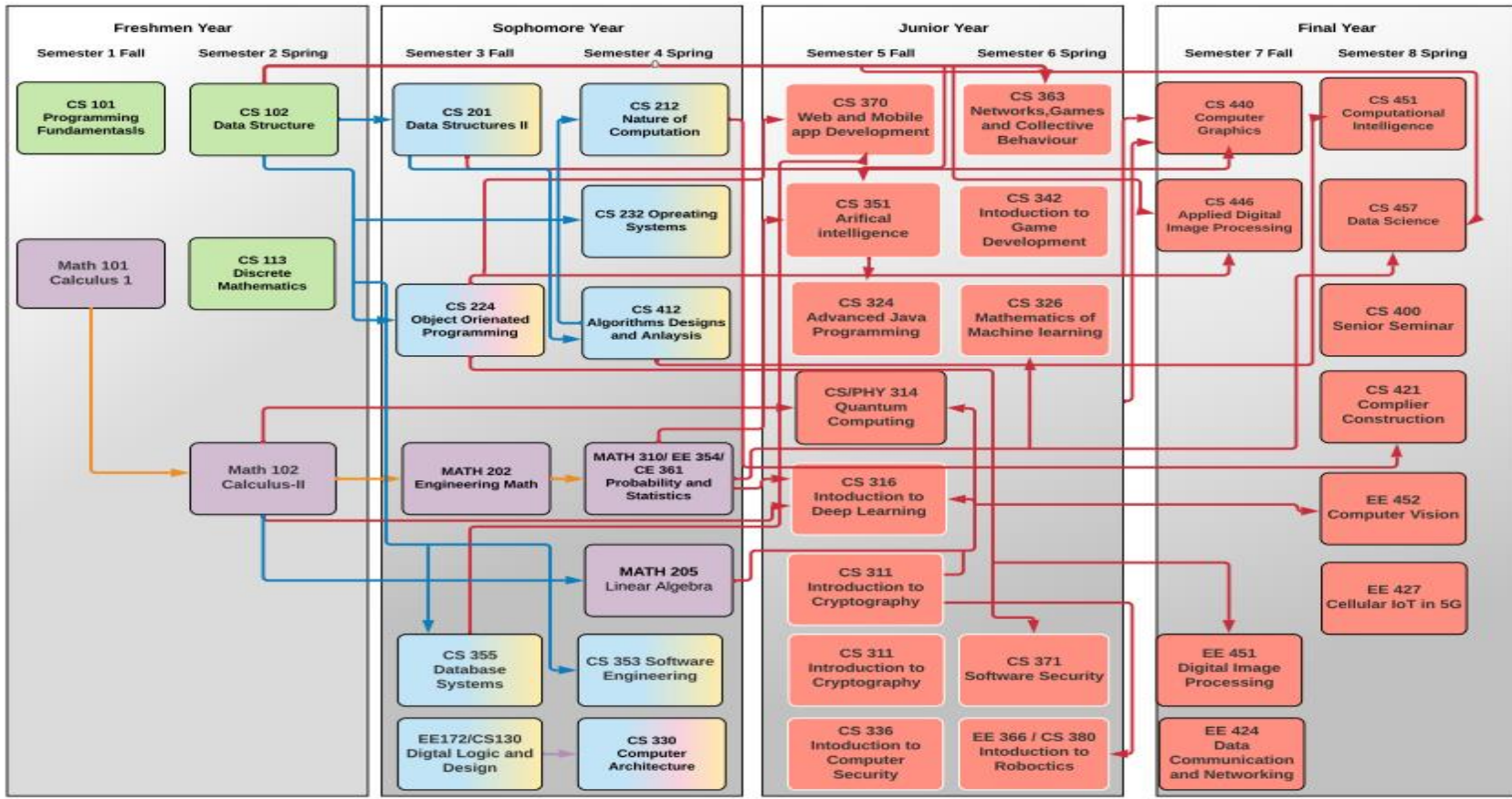
CS Kernel (Any 2 courses)

- CS 201 Data Structures 2
3+0, offered mostly in Spring semester
requires: CS 102, CS 113
- CS 212 Nature of Computation
3+0, offered mostly in Spring semester
requires: CS 113
- CS 224 Object Oriented Programming & Design Methodologies
3+1, offered throughout the year
requires: CS 102
- CS 412 Algorithms: Design and Analysis
3+0, offered mostly in Spring semester
requires: CS 102
- ...

CS Electives (Any 2 courses)

- CS 440 Computer Graphics
3+0, offered mostly in Fall semester
requires: CS 201, CS 224, MATH 205
- ...
- other program approved courses

Detailed requirements for CS Minor



Text Program Fundamentals
 Text CS Kernel
 Text Math pre requisites
 Text CS Elective

→ Math Pre- Requisites indicator

→ Electives Pre - Requisites indicator

→ Kernel Pre- Requisites indicator

11. Electrical and Computer Engineering (ECE)

Offered by: Electrical and Computer Engineering (ECE) Program

The increasingly blurring boundaries between various disciplines in the present world have placed students interested in multiple areas in the difficult position of choosing between those areas. The minor in ECE provides an opportunity to students enrolled in other programs at HU to be exposed to the extensive breadth of ECE discipline areas, without a substantial investment of time on their part. The minor has been designed such that the students have reasonable academic preparation in terms of the foundations of ECE, but then have the option to create their own path through the different concentrations within ECE, including Communications, Power and Energy, Signal Processing, Control and Robotics, Analog Circuits, Digital Circuits, Electromagnetics, and Embedded Systems.

Learning Outcomes

- Construct circuits and test them in the laboratory using basic test equipment or simulation tools, with intermediate level of proficiency
- Analyze the behavior of electric circuits and systems, and reach substantiated conclusions using mathematical techniques
- Design ECE systems, components or processes that meet specified needs at beginner level of proficiency
- Either apply knowledge from one technical discipline within ECE, or comprehend knowledge from a few technical disciplines within ECE

Eligibility criteria:

All Habib University students from all majors except those majoring in EE & CE are eligible for the ECE Minor.

Credits required:

22 (minimum)

The exact number of credit hours will depend on the nature of electives courses i.e., courses with/without a lab component. It may be noted that in case electives are being offered with labs then the course has to be taken with the lab.

Courses required:

07 accompanied by labs (where applicable). Some courses have prerequisites/co-requisites in CS or MATH. **Up to three courses can be double-counted towards both the student's major and the ECE minor.**

Details of the Courses

a. Core Courses (4) – 13 credit hours

Course Number	Course Code	Course Title	Pre-requisite(s)	Co-requisite(s)
1	EE-100	Introduction to Electrical and Computer Engineering (0-2 credits)	None	CS 101; EE 112
2	EE-112	Electric Circuits – I (2-0 credits)	None	EE/CE 100
3	ENGR-291	Engineering Workshop (0-1 credit)	None	None
One of the following four courses needs to be taken:				
4	EE-211 EE-211L	Basic Electronics (3-1 credits)	EE 112	None
	EE-172 EE-172L	Digital Logic Design (3-1 credits)	None	None
	EE-213 EE-113L	Electric Circuits - II (3-1 credits)	EE 112; MATH 201	None
	EE-252 EE-252L	Signals and Systems (3-1 credits)	MATH 101	None

b. Elective Courses: (minimum 9 credit hours)

Three additional courses are needed, out of which at least two should be at 300 level or above. At least one 300 level or higher course should be such that it is not being counted towards the student's major too. A list of approved electives for the minor can be requested from the program's office.

Note - It may be noted that in case electives are being offered with labs then the course has to be taken with the lab.

Grade Requirements:

A minimum grade of 'C+' is required in all mandatory courses.

Note:

- At most one of the 300 level courses and a maximum of three courses in total can be cross-listed with the student's major.
- Pre-requisite courses (if any) should have been passed by the student before enrollment in any of the courses.
- This scheme is applicable for students interested in pursuing ECE minor from Fall 2022 onwards.

Pathways for ECE Minor

