COURSE CATALOG
2022–23

Habib University
shaping futures

Disclaimer:

Habib University Course Catalog 2022-23

The catalog is not to be considered as a binding contract between Habib University and students, parents, or guardians of students, nor other interested parties. Habib University reserves the right at any time, without advance notice, to change any part, portion or provision of the catalog; no vested rights shall run or be created by the catalog, including the right to notice of any modification, novation, amendment, supplementation, or other change of any term, provision or content of the catalog; such right of the University to enact changes, etc., especially shall include but not be limited to:

a) Withdrawal or cancellation of classes, courses, and programs;
b) Changes in fee schedules;
c) Changes in the academic calendar;
d) Changes in admission and registration requirements;
e) Changes in the regulations and requirements governing instruction in and graduation from the University;
f) Changes in instructors;
g) Changes in the rules and regulations governing the students and student body organizations;
h) Changes of on-campus facilities, programs, and costs for room and/or board of students;
i) Changes of extra-curricular student activities, programs, and offerings; and
j) Changes to any other regulation affecting students, their parents/guardians, or other interested parties.

The official version of the Habib University Course Catalog is updated at the start of every academic year and resides on the Habib University website (See https://habib.edu.pk/office-of-registrar/academic-prospectus/).

Consult the University website (www.habib.edu.pk) for further information about the University.

This catalog is compiled by the Office of Academic Systems & Registrar and the Office of Undergraduate Education & Accreditation; produced by the Office of Marketing and Communications.

Habib University Course Catalog 2022-2023

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Vision

To be a global leader and South Asia's preeminent undergraduate liberal arts and sciences university.

Mission

Habib University's mission is shaping futures. The University accomplishes this mission by providing a demanding, contextually relevant and engaging world class liberal arts and sciences education to the most talented students, regardless of their financial capacity or any social considerations, thereby empowering them to build their futures, enrich their lives and become leaders in improving their country and the world.

Values

قِيمَةُ كُلِّ امْرِى ءٍ مَا يُحسِنُه

EVERY HUMAN BEING'S WORTH IS IN THEIR

YOHSIN

EXCELLENCE . PASSION . RESPECT . BEAUTY . SERVICE

Habib University's values are captured in the Arabic verb Yohsin (يحسن), which is rooted in the core Islamic notion of 'iḥsān. A multidimensional concept, with no single word corollary in English, Yohsin entails measuring each person's worth not only by the depth of their knowledge or skills, but by the application of their knowledge and skills to both personal self-cultivation and perfecting the world. This core philosophy is reflected in Habib's five aspirational values for all community members:

(1) strive for excellence,

(2) do what is beautiful in all actions,

(3) nurture passion,

(4) respect all others, and

(5) serve the community.

University Learning Goals

	Themes	Imp. Attributes	Goals
KNOW	Knowledge	Breadth & Depth	Demonstrate both a genuine breadth of knowledge through the Habib Liberal Core and a capable depth of knowledge through command of their chosen major.
	Interdisciplinary & Transdisciplinary	Synthesis & Connections	Synthesize knowledge, methods and viewpoints from different disciplines to both make meaningful connections among and transcend them.
	Context	Contextually Grounded	Demonstrate their knowledge is grounded in a firm understanding of the historical, social, political, economic, religious, regional and global contexts in which they are located.
ACT	Creativity & Innovation	Imaginative & Interesting	Imagine, develop and produce creative, original ideas, interpretations and works.
	Critical Inquiry	Analysis & Critical Thought	Analyze and formulate relevant critical questions, and answer those questions in a substantive way supported by quantitative and qualitative evidence.
	Communication & Collaboration	Interaction & Teamwork	Listen actively to comprehend the meaning of others and successfully express cogent meaning through capable oral, written, and artistic modes of communication. Effectively interact and collaborate with others.
VALUE	Social Impact	Service & Sustainability	Recognize the reciprocity of knowledge and service, and benefit their community, society and the environment through socially responsible and sustainable engagement.
	Thoughtful Self-Cultivation	*Yohsin* Values & Lifelong Learning	Cultivate lifelong curiosity by engaging in inquiry and reflection to acquire and apply new knowledge.
	Ethical & Cultural Competence	Personal & Professional Ethics	Develop and nurture their own beliefs, values and sense of responsibility to reach informed conclusions, while considering, appreciating and respecting the perspectives of others.

President's Message

Dear Habib University students,

Welcome!

A journey at Habib University is one of the most eye-opening journeys of your life, but it is also one of the most important. Pakistan has recently undergone several health, political, and economic crises, and now more than ever, we need our youth to come forward with creative solutions to address the crises. The courses on offer delve into historical investigation, critical analysis, formal as well as quantitative reasoning, and therefore equip you with the necessary knowledge, skills, creativity, and most importantly the attitude to make a difference in the world.

First Years, as you embark on your journey at Habib University, our range of courses, whether it is Rhetoric and Communication or Scientific Methods, no matter which major you choose, will give you a chance to reflect on, interpret, and provide solutions to national and global problems. A journey at Habib University will excite you, challenge you, engage you, ask a lot of you, but more than anything it will help you make sense of the chaotic world we live in and inspire you to become eloquent, thoughtful, and discerning leaders of the 21st century.

Sophomores and Juniors, as you continue your journey at Habib University, I hope you will delight in the wide range of courses on offer such as the power of music and how it connects all human cultures and communities, those that teach you the art of interpretation, and finally those that help you understand the interaction between spirituality, philosophy, and science.

Seniors, as you prepare to leave Habib University, Habib University prepares you for the world beyond through specially designed courses and the career curation program. These courses at Habib University from the study of Heidegger (one of the greatest thinkers of the 20th century), to the Anthropology of Trade (a means of prosperity but also a means of misery and injustice) to advanced quantitative and qualitative research have been carefully crafted to cultivate critical skills and abilities whether you decide to pursue higher education or a job, and teach you to transform your ideas into reality.

I wish you the best of luck as you begin or continue your journey here, and know that each day you spend at Habib University, you are making a difference, and truly becoming citizens of the world.

All the best,

Wasif A. Rizvi

President

Academic Calendar 2022-23

Fall 2022	
Independence Day	August 14, 2022
Orientation for New Students, and Academic Planning for Spring 2023	August 15 – 20, 2022
First Day of Classes	August 22, 2022
Last Day to DROP Courses	August 31, 2022
Last Day to ADD Courses	September 2, 2022
Arbaeen/Chehlum of Imam Hussain (AS)*†	September 18, 2022
Mid-Term Examinations	October 3 – 7 & 10 - 14, 2022
12th Rabi-ul-Awwal*†	October 9, 2022
No Classes	October 17, 2022
Diwali	October 24, 2022
Announcement of final class schedule Spring 2023 Academic advisement period begins	November 2, 2022
Last day to Withdraw from course(s) Fall 2022	November 4, 2022
Self-Service Enrollment for Seniors (Spring 2023)	November 10 – 11, 2022
Self-Service Enrollment for Juniors (Spring 2023)	November 15 – 16, 2022
Self-Service Enrollment for Sophomores (Spring 2023)	November 17 – 18, 2022
Self-Service Enrollment for First-Year Students (Spring 2023)	November 22 – 23, 2022
Last Day of Regular Classes	December 2, 2022
Reading Days	December 5 – 6, 2022
Final Examinations Fall Semester 2022	December 7 – 10 & 12-13, 2022
General Enrollment for Spring 2023 Resumes	December 8, 2022
Last Date to File Petition for Incomplete Grade	December 13, 2022
Faculty to discuss semester grades with students	December 14 – 16 & 19, 2022
Grades for Fall 2022 Due	December 20, 2022
Faculty departs for winter break	December 21, 2022
Spring 2023	
Faculty Returns	January 2, 2023
First Day of Classes	January 9, 2023
Last Day to DROP Course(s)	January 18, 2023
Last Day to ADD Course(s)	January 20, 2023
Letter grades for I Grades Awarded in Fall 2022 Due	January 23, 2023
Kashmir Day Holiday	February 5, 2023
Mid-Term Examinations	February 20 – 24 & February 27 – March 3, 2023
1st Ramadan*; The University Switches to Ramadan Schedule	
Pakistan Day	March 23, 2023
Conference Days (No Classes)	March 23 – 26, 2023
Last Day to WITHDRAW from Course(s)	March 31, 2023
Academic advisement period begins (Fall 2023)	April 5, 2023
Self-Service Enrollment for rising Seniors (Fall 2023)	April 13 – 14, 2023

Self-Service Enrollment for rising Juniors (Fall 2023)	April 18 – 19, 2023
Eid-ul-Fitr Holidays*	April 21 – 25, 2023
Self-Service Enrollment for rising Sophomores (Fall 2023)	April 27 – 28, 2023
Last Day of Classes	April 28, 2023
Labor Day	May 1, 2023
Final Examinations for Spring 2023	May 2 – 5 & 8 – 9, 2023
Last Date to File Petition for Incomplete Grade Spring 2023	May 9, 2023
Faculty to discuss semester grades with students	May 10 – 13, 2023
Grades for Spring 2023 Due	May 15, 2023
General Enrolment for Fall Resumes (Fall 2023)	May 18, 2023
Summer 2023 Schedule Announcement	May 19, 2023
Convocation	May 27, 2023
Faculty departs for Summer Break	June 12, 2023
Summer 2023	
First Day of Classes	June 5, 2023
Eid-ul-Adha*†	June 29 – 30 & July 1, 2023
Ashura*	July 26 – 28, 2023
Faculty returns	July 31, 2023
Last Day of Classes	August 3, 2023
Final Examinations for Summer 2023	August 4 – 5, 2023
Incomplete Grades for Spring 2023 Due	August 7, 2023
Grades for Summer 2023 Due and Official Announcement	August 10, 2023
Independence Day	August 14, 2023

Notes:
- Habib University reserves the right to correct typographical errors or to adjust the Academic Calendar at any time it deems necessary.
- Board of Faculty meetings will be scheduled in the 3rd or 4th week of each month, except for June and July.
- Academic Council meetings will be held in the 4th week of every even-numbered month, except for June.

* Subject to sighting of the new moon.
† No classes.

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About Habib University

As Pakistan's only exclusively undergraduate focused liberal arts and sciences university, Habib University leverages the American style of undergraduate education, and has developed a distinctive world-class liberal arts curriculum that is contextually relevant and grounded to our South Asian context and heritage. Habib University's liberal arts and sciences framework offers students broad-based knowledge across a variety of disciplines while delving deeply into a specific field. It proves a combination of technical expertise and vital soft skills, qualities that are highly sought in today's professional world.

Passionate and supportive, Habib University's internationally qualified faculty is invested in their students' academic, personal and professional success. As dedicated teachers, respected experts and innovative researchers, they will share their experience with students, involve them in their projects and prime them to embark fearlessly on their academic journey. Habib University provides a meta-curricular learning experience which takes students beyond conventional academics.

Student Life activities are a large part of what defines learning at Habib. Through these activities, students will encounter diverse perspectives and find solutions to real-world problems, making their learning experience a truly transformative one. With multipurpose recreational spaces, technology-enabled classrooms, state-of-the-art labs and studios, and much more, Habib University's purpose-built campus provides students plenty of opportunities to maximize their potential.

Habib University forms a diverse community of learners hailing from a variety of backgrounds, who bring with them a myriad of perspectives and opinions. Encountering such different people and ideas builds an awareness of global perspectives among students.

Global partnerships have been instrumental in the development of Habib University, enabling us to adopt the best practices in higher education. Partnerships with two of the top universities in the US – Texas A&M and Carnegie Mellon – have resulted in mutually enriching and supportive relationships from the early stages of institutional planning through curriculum development to ongoing academic operations and administration. Habib University is also collaborating with leading undergraduate liberal arts colleges – including Harvey Mudd College and Pitzer College, in Claremont, California – on faculty and student exchange, faculty development, co-teaching of courses, and program development. To expand student opportunities, Habib University has partnered with some of the world's leading programs and universities, including Stanford University's Summer International Honors Program, University of California at Berkley and University of Michigan at Ann Arbor. These are highly competitive programs that allow our top students to spend a Summer for study abroad.

Academic Policies

(Applicable to all Habib University students, faculty, and academic staff)

Academic Rights and Responsibilities

Habib University is a community of learners founded on the basis of the right to freedom of thought and respectful exchange of ideas. Neither students nor faculty should be disadvantaged on the basis of their political, religious, or other opinions. No member of the Habib University community will behave in any manner that infringes on the rights of any student or faculty to teach, learn, carry out research, or pursue creative or other activities connected to the University.

Students are expected to attend all classes, seminars, and labs and to follow any other reasonable course of study as determined by their instructors, academic advisors, or the Board of Faculty. Classroom assignments and course/degree requirements should be completed as prescribed in order to allow faculty sufficient time for adequate evaluation. Failure to fulfill these responsibilities may adversely affect course grades, cumulative grade point average (CGPA), and/or progress within the student's degree program.

Academic dishonesty shall be considered a serious violation of these responsibilities and will be subject to strict disciplinary action as prescribed by the Habib University's 'Student Code of Conduct and Honor Code.' Academic dishonesty includes, but is not limited to, cheating, plagiarism, and collusion.

Faculty shall evaluate student performance based upon the expectations and the actual content of the class, lab, studio, or another course of study as defined and communicated to the students by the faculty member at the outset of the course. Students who feel that they have received a capricious or arbitrary grade can appeal said grade as defined elsewhere in this document.

University Statement of Anti-Discrimination

Habib University is committed to providing a learning environment free from discrimination and to nurturing a diverse and vibrant University community while respecting the fundamental dignity and worth of all of its members. Supporting this commitment, the University does not tolerate discrimination in any form and provides mechanisms for redress for students who feel they are being discriminated against.

Habib University does not discriminate against any person in the management and administration of its academic and admission policies, scholarship and financial aid programs, and other University-administered programs. Nor does the University permit the harassment of any student or applicant on the basis of race, color, sex, gender, religion, national origin, creed, disability, marital status, sexual orientation, partnership status, pregnancy, age, military status, or any other legally protected status.

The Office of Community Values and Standards (OCVS) is responsible for coordinating the University's adherence to this policy and for complaint procedures in regard to discrimination or harassment.

Academic Advising

Academic Advising is a central element of the undergraduate experience at Habib University. Every student enrolled at Habib University is assigned two advisors: (i) a faculty advisor belonging to the student's program, and (ii) an advisor in the Office of Academic Performance (OAP), at the time of enrollment. Advising is intended to be a collaborative relationship between a student and their advisors through which students create educational plans consistent with their personal, academic, and career goals. Students should meet with their advisors at least three times per semester to discuss their academic progress. Students who are struggling academically should first speak with their academic and OAP advisors for guidance. Students who have been placed below good academic standing must meet with their academic and OAP advisors as described later in this document.

A student's academic advisor is listed in the University's Campus Management System (PeopleSoft) available via the Student Portal at the University's Intranet. Students wishing to change their advisor should make a formal request to the Office of Academic Performance.

Declaration of a Major

All first-year students must declare their major at the time of admission.

Change of a Major

Students wishing to change their major must submit a 'Change of Major' application form to the Office of Academic Systems & Registrar. A change of major application must be endorsed by the student's academic advisor and the Office of Academic Performance, and approved by the concerned Program Director/Assistant Dean. Once the approval process is complete, a coursework/graduation plan must be submitted by the student to the Office of Academic Systems & Registrar based on the graduation requirements for the most recent catalog year of the new major. This plan must be developed in consultation with the student's academic advisor and the Office of Academic Performance. The Office of Academic Systems & Registrar will process a change of major and notify the student and all concerned University offices including the Office of Student Finance for any financial adjustments needed that result from this change. Depending upon how many courses are transferred from the previous major to new major, a change of major may result in lengthening the student's stay at Habib University beyond eight semesters.

Note: Due to student enrollment limits placed on certain majors by their relevant accreditation councils (such as the Pakistan Engineering Council, the National Computing Education & Accreditation Council, etc.), endorsement by the Office of Undergraduate Education & Accreditation may additionally be required for a change of major request to be approved.

Declaration of a Minor

Minors provide students at Habib University the opportunity to pursue an area of secondary specialization. A minor consists of a smaller set of courses within a well-defined area as determined by the awarding program and duly approved by the University's Academic Council. Students

interested in completing a minor must declare their choice as early as possible, at the latest before the end of enrollment of their seventh semester, by submitting a Declaration of Minor Form to the Office of Academic Systems & Registrar.

Transfers

All transfer requests, including transfer of credits, will be reviewed on a case-by-case basis. Incoming students who have completed university-level course work at other institutions may request for transfer of credits. All students, regardless of their transfer status, must (i) satisfy the University's Liberal Core requirements, (ii) spend at least four semesters at the University as full-time students before graduation, and (iii) fulfill transfer criteria as per the University and Higher Education Commission (HEC) policies. Courses cannot be transferred to fulfil the Habib Liberal Core requirements.

Enrolled students at the University may submit a request for transfer of credits earned at other recognized institutions (e.g., through the University's Learn Abroad program) to the Office of Academic Systems & Registrar. On receiving a form that is duly-filled and signed by student, the Office of Academic Systems & Registrar sends the form along with the necessary documents (as mentioned in the form) to the relevant Program Director for approval of the Program Board of Studies (BoS). On receiving an approval of the Program BoS and the concerned Assistant Dean of the school, the Office of Academic Systems & Registrar processes the application and notifies the student and all concerned departments/units accordingly.

Courses for which transfer of credits is approved appear on the student's transcript with a 'TR' (transfer) grade, which is not counted towards a student's semester/cumulative GPA. Further details and procedures are available in the Habib University's Transfer of Credits Policy.

Attendance/Engagement Policy

Class attendance is integral to student success and all Habib University students are expected to maintain 100% attendance in all classes in which they are enrolled. Attendance and absences will be recorded in the University's Campus Management System (PeopleSoft) using the biometric devices installed in all academic spaces. Course instructors have the discretion to authorize students with legitimate excuses to be absent for the specified limit as mentioned in the syllabus for each course (not more than 15% of the total sessions).

Attendance during Add/Drop period will be recorded and will count towards the mandatory minimum threshold of 85% or more attendance for all classes. Therefore, any absences during this period will be counted towards the maximum number of excused absences a student can have during a semester.

It remains each student's responsibility to ensure that their attendance record for each course is accurate, and the student is responsible for reporting any discrepancy in the attendance recording system in writing via email (to confirm the discrepancy was duly reported) to the instructor within 48 hours of the class session in question.

Excused absences are at the discretion of the instructor and are never automatic. Therefore, whenever possible, students should secure the instructor's permission prior to the absence. Students are solely responsible for making up or catching up on work they have missed in a course due to an absence, regardless of whether it is excused or not.

In cases of major life events (such as the death of a close relative) or serious illness or injury - confirmed by a written explanation provided by a competent and relevant medical professional deemed acceptable by the Office of Academic Systems & Registrar (RO) - the RO will communicate the acceptance of the documentary evidence to the student and concerned faculty. The course instructor may then authorize up to an <u>additional 10%</u> of class absences from a course beyond either the University maximum of 15% of excused absences (this translates to a minimum of 75% mandatory attendance).

However, if a student needs longer leave even under the limit defined by the course instructor – due to medical conditions or otherwise - they should submit a leave of absence with documentary evidence to the Registrar's Office (RO).

If a student is absent for more than the specified limit for a given course, the RO, in consultation with the faculty, can drop the student from the course and a grade of 'W' will be entered on their transcripts if the student is <u>dropped before the course withdrawal deadline</u> in the semester, <u>otherwise a grade of 'F'</u> will be entered on their transcript.

However, the student has a right to appeal to the Committee on Academic Standing (CAS). The appeal to CAS must be filled by the concerned student within three working days of the notice of the withdrawal to the student. The student shall continue to attend the classes and the faculty is expected to continue to grade the student until the decision is made by the Committee.

A student dropped from a course due to low attendance may repeat the course, subject to the University's Course Repeat Policy, if and when the course is offered again.

Grades and their Numerical Equivalents

Letter Grade	Scale
A+	4.00
A	4.00
A-	3.67
B+	3.33
B	3.00
B-	2.67
C+	2.33
C	2.00
C-	1.67
F	0.00

Letter Grade	Definition
AU	Audit
CR	Credit (Pass)
I	Incomplete
NC	Non-Credit (Fail)
P	Pass
R	Repeat
R*	Repeat (substitute)
S	Suspended
TR	Transfer
W	Withdrawal

Grade Point Average (GPA)

At the conclusion of each semester during a student's tenure at the University, grade point average will be reported in two ways:

- Semester GPA (SGPA): GPA for a single semester only;
- Cumulative (CGPA): A cumulative GPA for the duration of the student's enrollment.

Semester and cumulative GPAs are calculated only for courses attended at the University. In some cases, GPAs might be calculated for a school, program, concentration, or major. However, these specialized GPAs will not appear on a transcript.

Calculating GPA

The formula for calculating GPA or CGPA is to divide the Total Quality Points (TQPs) earned in all courses by the Total Attempted Credits (TACs).

$$GPA = \frac{Total\ Quality\ Points\ (TQP)}{Total\ Earned\ Credits}$$

Quality Points (QP) for a course equal the course credit hours multiplied by the numeric value of letter grade earned in the course, as per the grading scale. Total Quality Points is the sum of Quality Points of all the courses that are included in the calculation of GPA.

- Grades A+ to F earned in a course shall be counted towards the calculation of SGPA and CGPA.
- Grade F replaced by R or R*, upon repeating a course, shall not be counted towards the calculation of SGPA and CGPA.
- The following grades shall not be counted towards the calculation of SGPA or CGPA: Audit (A), Withdraw (W), Incomplete (I), Transfer (T), Suspended (S), Credit (CR), Non-Credit (NCR), Pass (P).
- In case of a change of major, grades of the following courses earned while pursuing previous major will be transferred to new major and will be counted towards the calculation of CGPA:
  - All Liberal Core Courses irrespective of grade(s) earned;
  - Any core courses relevant to the new major irrespective of the grade earned;
  - Courses with a passing grade that may be eligible for transfer to new major as electives.
- In case of a change of major, the courses and respective grades which are not transferred to the new major will also be listed on the transcript but their grades and credit hours will not be counted towards the calculation of CGPA. All passing grades of the courses not transferred will be recorded as CR and failing grades will be recorded as NCR or R, as per the number of attempts made for a failing course.

First Semester Grades

The first semester is the transition semester from high school to a university environment for first year students. The transition requires them to learn new skills, adjust to a new environment,

understand university expectations, and learn to manage themselves as independent learners. This policy has been developed to allow for an enriching first semester experience, without the pressure of maintaining a high semester grade point average (GPA) required to be in good academic standing.

- Students' aggregate scores in a course will be converted into CR for a pass grade and NCR for a F grade for all the courses attended in their first semester at Habib University.
- The cut-off for CR will be equivalent to the passing grade as described in the grading scheme of the most recent course catalog.
- Aggregate scores are awarded for the purpose of determining CR/NCR status. These will not be recorded in the students' transcript or in any other official document.
- CR/NCR will not be included in the calculation of the final Cumulative Grade Point Average (CGPA) that appears on a student's transcript. However, the number of credits earned during the first semester will be counted in the total credits required to graduate.
- Students earning an NCR in one or more first semester course(s) may repeat the same course(s) or equivalent, in subsequent semesters. For such courses, the grading policy of CR/ NCR shall apply.
- First semester CR/NCR will be considered in assessing students' academic standing status. First year students receiving one NCR (noncredit grade) or more in the first semester will be placed on 'Academic Warning' as per the University's Academic Standing Policy.
- Habib University's financial commitment to first year students, if any, will not be affected by their first semester grades.
- First year students will be considered eligible for student employment in the second semester of their study at Habib University if they earn CR in all of their first semester courses.

Incomplete (I) Grade

Students are expected to complete all academic coursework and assignments during a semester latest by the last day of classes for that semester. If a student is unable to complete a course due to serious illness or exceptional circumstances beyond their control, and the work completed to date is of passing quality, they may request an Incomplete (I) grade from the instructor, provided that the grade gives no undue advantage to that student. Incomplete grades are not a privilege and are only awarded to students under exceptional circumstances i.e., they cannot be awarded as part of a course's assessment and grading policy.

Procedure

Student-Faculty Meeting

The student is expected to first meet with the faculty member of the course and determine together if the outstanding work can realistically be completed within 6 weeks of the last day of exams for the semester. This meeting is expected to take place in advance of the deadline for incomplete requests, which is the last day of final exams for a semester. Under exceptional circumstances where students are unable to meet with the faculty member (e.g., the student is hospitalized), the faculty member

may proceed with submitting the petition for an incomplete on behalf of the student, but indicate why the meeting with the student has not occurred.

Only the instructor for the class may submit the petition for an Incomplete request, and must do so no later than the last day of exams for the semester.

Review of Incomplete Petitions by the Associate Dean for Academic Systems

Before making a decision, the Associate Dean for Academic Systems may request to meet with the student and faculty member to discuss the incomplete request and to clarify arrangements for the completion of outstanding work. The Associate Dean may also request documentation from the student or faculty member if documentation has not been provided and/or is deemed necessary. Students and faculty will be notified of the Associate Dean's decision regarding the incomplete request by e-mail.

If the request for an incomplete grade is approved, an "I" grade will be entered in the student's record for the course. Incomplete grades are not calculated into a student's grade point average.

Change of Grades

Grades awarded at the end of a semester/term for each course are considered final. Instructors may submit to the Office of Academic Systems & Registrar a Change-of-Grade request clearly mentioning the reason for which a change of grade is needed, which can only be due to a calculation or a clerical error. Change-of-grade requests are then reviewed by the Associate Dean of Academic Systems and approved by the Dean of Faculty. Change-of-Grade requests must be submitted by the course instructor latest by the end of the subsequent semester.

Course Lettering and Numbering

All courses are designated by a letter prefix denoting the program/subject area in which the course originates. The prefix code is followed by a three-digit sequence denoting the course level. Levels are designated as follows:

000 – Pre-University and/or noncredit courses offered by the University. This may include some transitional courses.

100 – Courses that are generally taken in the first year.

200 – Courses that are generally taken in the second year.

300 – Courses that are generally taken in the third year.

400 – Courses that are generally taken in the final year of study.

In general, the course level dictates the point at which a student should take a particular course within the sequence of requirements. Typically, 100- and 200-level courses are categorized as lower-division whereas 300- and 400-level courses are categorized as upper-division courses. Before enrolling in a course, students should check all of the course prerequisites to make sure that they are eligible to enroll in that course.

Cross-listed courses must be approved by all the participating programs/teaching units through their respective Program Boards of Studies. Approved cross-listed courses shall have the prefixes of all the participating programs.

Course Repeat Policy

Students are permitted to repeat any course offered by the University, either to improve their original grade or to clear a course in which an 'F', 'W' or 'R' grade was received. A student is permitted to retake a course two (02) times only, for a total of three (03) attempts. All attempts will be recorded on the student's transcript, but only the best-earned grade will be counted towards GPA. All other attempts will be recorded with an 'R' grade, denoting Repeat.

The University is not obligated to re-offer elective courses, but courses defined as graduation requirements (e.g., Habib Liberal Core or programmatic/core requirements), must be re-offered or, if the course has been significantly redesigned or discontinued, must have an equivalent course defined by the relevant Program Board of Studies. The grade(s) earned in the discontinued course will be recorded on the transcript with an 'R*,' denoting that the original course has been discontinued and the requirement is met with a new course.

Students failing to clear courses required by their chosen program, especially those that are prerequisite(s) for later courses, may be unable to graduate within eight (08) regular semesters and must seek advice from their academic advisor and the program. The Office of Academic Performance (OAP) shall provide additional advising and academic support, in collaboration with the offering program, on a per case basis. Students failing a required course twice should give careful consideration to the chosen field of study and should seek advice from their academic and OAP advisors regarding future course of action.

A course repeat fee may be charged for any repeated course, regardless of the reason for a repeat.

Maximum and Minimum Course Load

Full-time students at Habib University must register for a minimum of twelve (12) credit hours in a semester to maintain full-time status. The maximum allowable course load per semester is twenty (20) credit hours.

Students with a cumulative GPA (CGPA) of 3.0 and above who are in their third or final year may submit a request to the Office of Academic Systems & Registrar to enroll in an additional course beyond the maximum allowable limit (i.e., overload). Students who have completed their seven regular semesters and require less than 12 credits in order to complete their degree requirements, may request to enroll in less than 12 credit hours (i.e., underload). All requests to overload or underload are subject to approval by the Committee on Academic Standing.

Failure to maintain full-time status may affect student's financial aid and scholarship. Students who are allowed to take course overload may be charged an additional fee. In either case, students are advised to consult with the Office of Student Finance for details of financial implications of course overload and underload.

Auditing a Course

Students may audit a course for self-enrichment and academic exploration. An audited course will appear on the transcript with an "AU" (audit) grade. An audited course does not earn a grade or credit, is not included in the calculation of GPA, and does not count toward the minimum course load required for continuous enrollment. Students registering for a course for credit have priority over those wishing to audit the course. A student auditing a course may be asked to drop the course during the semester enrollment period if another student wants to enroll in the course for credit.

Audit courses do not fulfill degree requirements, but the credit value of audited courses may be included in the semester load for determining fees and the maximum number of credits carried each semester. An audited course cannot be used to meet the pre- or co-requisite condition of another course. The extent to which a student may or may not be required to participate in the audited course, including attendance or engagement, is determined by the instructor prior to enrollment. For example, the instructor may decide if a student auditing a course will be permitted to take exams, submit homework and have it evaluated. Students choosing to audit a laboratory course may be required to pay the additional lab fee.

The process for registering to audit a course is the same as registering for a course for credit along with the following additional requirements:

- Students wishing to audit a course must obtain approvals from the course instructor and their academic advisor and submit them to the Office of Academic Systems & Registrar using the Add/Drop course form before the end of the enrollment period.
- For courses with a laboratory component, approval from the lab instructor must also be obtained.
- The program that offers the course may have additional requirements. Students wishing to audit the course should contact the concerned Program Director for information about these requirements.

Changing a course status from audit to credit, or from credit to audit, or dropping an audit course must be done during the semester enrollment period. A student wishing to change from credit to audit status must meet the additional requirements of registering for an audit course.

An additional fee may be applicable for auditing a course if a student exceeds the maximum allowable course load. Students on financial aid should bear in mind that any fee for auditing a course may not be covered in their financial aid package. It is the student's responsibility to resolve all financial matters related to auditing a course by contacting the agency administering the scholarship or the Office of Student Finance.

Academic Standing, Probation, and Dismissal Policies

Habib University requires that all students maintain good academic standing. Academic standing is determined by academic performance and is measured through a cumulative grade point average (CGPA). Failure to maintain good academic standing may result in an academic warning, first academic probation, final probation, or dismissal. At each stage, below good academic standing,

students are provided learning support and advice in order for them to achieve good academic standing.

The Academic Standing policy defines good academic standing as well as identifies the circumstances under which a student is placed on academic warning, first academic probation or final probation, and the consequences of these standings.

Details of Academic Standing

Good Academic Standing

Students who maintain a minimum cumulative grade point average (CGPA) as per the University's graduation requirement i.e., 2.33 and a fulltime status by enrolling in minimum 12 credit hours per semester are considered to be in 'Good Academic Standing.'

Students who do not maintain good academic standing will not be eligible for the following:

- Habib University's Learn Abroad or Research Abroad programs;
- Dean's Honors List of the University in a given regular semester;
- Student employment opportunities;
- Scholarships and/or financial aid.

Academic Alert

The following two categories of students, while still in 'Good Academic Standing,' will be considered to be on 'Academic Alert.'

- Students who maintain a CGPA between 2.33 and 2.67;
- Students who maintain a CGPA above 2.33 but their semester GPA (SGPA) falls below 2.33 in any semester.

An 'Academic Alert' triggers interventions by the Office of Academic Performance (OAP) and concerned academic programs. It is intended to provide timely academic support to prevent a student from losing their good academic standing. No official letter will be issued to students on Academic Alert.

Academic Warning

Students will be placed on 'Academic Warning' in one or more of the following situations:

- Their CGPA falls below 2.33;
- First-year students receiving one or more NCR (non-credit fail) grade in the first semester;
- They fail to maintain a full-time status.

Students will return to 'Good Academic Standing' if they meet the requisite conditions as defined under Good Academic Standing.

Students on Academic Warning must meet with their academic advisor in OAP and their faculty advisor to design an Academic Success Plan. If the student achieves a CGPA of 2.33 at the end of the semester, the student shall be restored to 'Good Academic Standing.'

First Academic Probation

Students who are already issued an 'Academic Warning' will be placed on 'First Academic Probation' if they fail to return to 'Good Academic Standing' by the end of the semester in which they were given the 'Academic Warning.' A student will return to 'Good Academic Standing' if they meet the requisite conditions, as defined under 'Good Academic Standing.'

Students on 'First Academic Probation' must meet with their academic advisor in OAP and their faculty advisor to revise the Academic Success Plan. During the probation period, students should expect close academic supervision and must meet with their OAP and faculty advisors as highlighted in the Academic Success Plan.

Final Academic Probation

Students will be placed on 'Final Academic Probation' if they fail to achieve 'Good Academic Standing' by the end of the semester in which they were placed under 'First Academic Probation.' Students on 'Final Academic Probation' will remain actively enrolled but under the direct supervision of OAP and the relevant program director.

Students on 'Final Academic Probation' will not be allowed to enroll in more than twelve (12) credit hours and in any new course(s) unless their required repeat courses are not available. Students will enroll only in the courses suggested by their faculty advisor and OAP. They will also undergo any additional intervention plan mandated by the Office of Academic Performance and the relevant faculty advisor and program director(s). Students will return to 'Good Academic Standing' if they meet the required conditions, as defined under 'Good Academic Standing.'

Students on 'Final Academic Probation' must meet with their academic advisor in OAP and their faculty advisor to revise their Academic Success Plan. During the 'Final Academic Probation' period, students should expect close academic supervision and must meet with their OAP and faculty advisors as highlighted in the Academic Success Plan. Students on 'Final Academic Probation' must achieve a CGPA of 2.33 to return to the status of 'Academic Warning' for an additional semester.

Academic Dismissal

Students will be dismissed from the University if they fail to achieve the CGPA required to maintain 'Good Academic Standing' by the end of their 'Final Academic Probation' period. Additionally, students who refuse to follow the mandated course plan during 'Final Academic Probation' may also be dismissed from the University. Students dismissed for academic reasons are not eligible for readmission to the University or a tuition refund.

Academic Standing of Students Changing Major

The academic standing of students who change their major will be determined using the GPA of courses which are relevant to their new major.

Withdrawals

Occasionally, it may be necessary for students to withdraw from one or more course during a semester due to personal reasons. It should be used only when, in consultation with a student's academic advisor, there is no other alternative.

Administrative/Non-Voluntary Withdrawal

Habib University reserves the right to administratively withdraw a student from classes.

The University may at any time decide to administratively withdraw a student if it finds such action is needed to maintain a campus environment that is conducive to its educational purpose, to maintain order, and/or to protect the rights and safety of its community members. To this end, officials may order the involuntary withdrawal of a student from the University and/or from its residence facilities in accordance with institutional policy.

This policy will cover behaviors as described herein and that occur on University premises or at organizationally sponsored activities, but it also may address off-campus behavior if the University determines that the behavior has otherwise damaged the University, its property, or that of another community member irreparably; likewise, if the continued presence of the student is seen to impair, obstruct, interfere with or adversely affect the mission, process, or functions of the institution; or if they engage or threaten to engage in behavior that poses a danger or physical harm to oneself or others at any time.

Procedures Under this Policy

This policy should not be seen as a substitute for appropriate disciplinary action as outlined in the Code of Conduct and procedures herein may run concurrently with those processes. This procedure may be implemented at any time in consultation with the competent authority, or if the Head of Student Life deems it necessary to do so.

Upon receiving a referral or report of an issue involving a student that could fit under this policy, the Office of Community Values and Standards (OCVS) will conduct a review of the information provided. If warranted, an immediate meeting with the student may be requested. After the meeting, the appointed official may take one or more of the following actions:

- Determine that the guidelines have not been met for involuntary withdrawal and terminate the process entirely;
- Determine that the guidelines have not been met and refer the case to the student conduct process;
- Require that the student schedule an evaluation by a qualified, licensed, mental health professional outside of the University at the student's cost;
- Invoke an interim suspension pending further investigation and/or the outcome of a student conduct case;
- Impose additional requirements on the student that must be met in order to continue enrollment;

- Allow a student who meets the conditions herein to voluntarily withdraw from the University and waive the right to further procedures under this policy and any privilege to enroll in the University again;
- Proceed with an immediate administrative withdrawal.

Student's Failure to Comply

A student may, with an immediate effect, be involuntarily withdrawn and/or disciplined under the policy and forfeits any right to appeal for any of the following conditions:

- Failure to attend any required meeting;
- Failure to schedule and/or appear for any directives as associated with this process;
- Failure to adhere to any conditions placed on the continued privilege to enroll in the institution.

Forced Withdrawal

Until a particular case of alleged misconduct has reached a final decision, the student shall retain all privileges to attend classes, use campus facilities, and otherwise be present on campus. As an exception to this shall be in cases where, in the view of the competent authority, a threat to the teaching/learning environment at the University, or the safety of community members is at risk. The University will take steps to ensure the protection of university property, and the University may decide to invoke an interim withdrawal of these privileges at any time. When in the opinion of the University an interim withdrawal/suspension is to be imposed, notification to the student may come in either verbal or written form. Within three (3) business days of an interim action, a student should be notified in writing of any formal allegations. The student will be given the opportunity to resolve the issue, either formally or informally, within ten (10) business days according to the policies and procedures contained herein or in any other University publication.

Appeals

A student may appeal an involuntary withdrawal using the same procedures as outlined in the student conduct process and the grievance policy.

Family Emergency and Medical Withdrawal

On rare occasions, a student may have an emergency in the family or a medical reason that prevents them from completing a term. The student or student's family should notify the Office of Academic Systems & Registrar as soon as possible to request a Family Emergency or a Medical Withdrawal. It may be asked that proper documentation is submitted along with a 'Medical Leave of Absence' application.

In cases where the onset of the issue at hand was sudden and/or the student or family were unable to notify the University, the University may grant a retroactive Family Emergency or Medical leave. In such cases, a written request clearly stating the reasons and documentation should be submitted as soon as possible to the Office of Academic Systems & Registrar.

Appropriate documentation for a withdrawal in this category consists of a letter from the student's attending medical provider that specifies the following:

- Date of onset of illness or other issues;
- Dates under professional care;
- General nature of the medical condition or other issue and why/how it has prevented the student from completing coursework;
- Date the student was last able to attend school;
- Date of anticipated return to school.

Grading after Withdrawal

All withdrawals completed after the course drop period will be noted on the transcript with a 'W' grade. Signed course withdrawal forms must be turned in to the Office of Academic Systems & Registrar before the deadline as stated in the academic calendar for the current year.

Interim Withdrawal/Leave of Absence

A request for a leave of absence will be granted if a student is not able to register for classes for more than one regular semester for a documented reason. Students should consult with the academic advisor and the Office of Academic Performance before applying for Interim Withdrawal/Leave of Absence from the University.

A leave of absence is good for up to one academic year and may be renewed only once for up to one more year. To file for a leave of absence, an Interim Withdrawal/Leave of Absence Request Form may be obtained from the Office of Academic Systems & Registrar and must be signed by the academic advisor and the concerned assistant dean of the school. In the event that the student has not declared a major, the Director of Academic Performance will approve the application.

Students taking Interim Withdrawal/Leave of Absence must bear in mind that the Higher Education Commission (HEC) requires students to be enrolled in at least eight (8) regular semesters in order to complete a four-year Bachelor's degree. Hence students proceeding on Leave of Absence will have to complete the required semester count as one of the degree requirements.

Summer Semester

Summer semesters are offered at Habib University in addition to the regular semesters. The semester dates, course offerings, and enrollment are announced and handled by the Office of Academic Systems & Registrar. Fulltime students at Habib University may enroll in courses offered in the summer semester to:

- Repeat a course if an 'F' or 'W' grade was awarded for that course previously;
- Improve grade for a previously attended course;
- Attend any additional courses other than those required to fulfill requirements of a major program offered at Habib University, e.g., to fulfill requirements of a minor.

Students may enroll in a maximum of two (02) courses (or 08 Credit Hours) in a summer semester at the University. All University academic policies and regulations including the Attendance and Academic Standing policies will apply as in the regular semesters. All financial policies for a summer semester, including tuition, fees (if applicable) and discounts are announced by the Office of Student Finance.

Further details are available in the University's Summer Semester Policy.

University Records

Habib University maintains students' educational records and ensures their right to access and privacy of information maintained in these records. The following guidelines provide procedures for maintenance of and access to student educational records held by the University.

Definitions

For the purpose of these guidelines, the terms used herein are defined as follows:

Education record – any record, document, or material maintained by the University (either directly or through a third party) that contains information directly related to the student which is recorded on any medium including, but not limited to, handwriting, print, audio, video, tapes, or electronic storage.

However, the definition of education record does not include:

- Records that are maintained by university officials in their personal capacity and are not available to others;
- Records established and maintained by campus security;
- Employment records of the students employed by the University;
- Records maintained by the Health and Wellness Center when the records are maintained solely for the purpose of treatment of the student;
- Records that are maintained after the person is no longer a student, such as Alumni records.

Parent – the natural parent, guardian, or an agent nominated by the parent/guardian to act as such.

University Official – an individual employed by the University in an administrative, supervisory, academic, research, or support staff position; a member of the Board of Governors; an individual performing special tasks for the University, such as an attorney, or an auditor; a contractor, consultant, volunteer, or other outside party providing institutional services; and an individual serving on an official University committee, such as the disciplinary committee, or assisting the University in the performance of official tasks.

Personally Identifiable Information – any information linked or linkable to a student that, alone or in combination, would allow an individual of the campus community, who does not personally know the student, to identify the student with reasonable certainty.

Legitimate Educational Interest – an individual has a legitimate educational interest in education records if the information or record is relevant and necessary to the accomplishment of some employment or other institutional tasks, service, or function.

Disclosure – to permit access to, to release, to transfer, or to communicate students' education records, or personally identifiable information contained in those records.

Disclosure to Parents

The University reserves the right to release educational records to parents of students as per the University's 'Parental Access and Notification' Policy. The University does not require a student's consent to disclose information related to

- The student's violation of local or federal laws;
- The policies of the University;
- Information about academic standing of the student;
- Any disciplinary action taken against the student.

Disclosure to Third Party

The University does not disclose information to any third party without written consent of the student or otherwise covered in this policy. Some examples of requests for which the University does not require written consent of the student are listed below:

- If requested by a university office for legitimate educational use;
- If requested by another school where the student seeks or intends to enroll, or is already enrolled;
- Under Judicial Order or lawfully issued notice in a litigation against the University, or for disciplinary action against the student;
- In connection with the Financial Aid Program as necessary to determine eligibility for amount or conditions of the aid, or to enforce the terms and conditions of the aid;
- Needed for a collection of financial obligations to the University in case of delinquency of payment by the student;
- In case of threat of harm to self or others.

Official Communication with Students

Official communication with students will be through the University email.

Students are responsible for checking their university-provided email accounts frequently and consistently and for adhering to deadlines contained in emails from the University and/or its faculty or staff members.

The University will not respond to a student via a non-University email account.

Communication with parents will be through courier, or through the phone. It is the student's responsibility to ensure all contact information is kept current by reporting any changes to Office of Academic Systems & Registrar.

Mid-Term and Final Exam Policies

Final Examinations

Final examinations are given at the end of each semester during the exams weeks designated in the University's academic calendar and are regulated either by the University's 'Examination Policy' or 'Online Examination Policy' as the case may be. The final examination schedule is announced by the Office of Academic Systems & Registrar.

All students registered in a course for which a final exam is given must attempt the exam at the scheduled time unless an exception is approved by the Dean of Faculty.

Midterm Examinations

The schedule of midterm exams, be they within or outside the scheduled class hours, are announced by the instructor and conducted during the midterm week announced by the Office of Academic Systems & Registrar before the start of each semester. For courses in which more than one midterm exam is administered, one midterm exam will be scheduled during the allocated week for mid-term exams. Examinations are announced in the course syllabus distributed to the class during the first week of classes.

Missed Examination

All students are expected to complete their assessments, including exams, within the specified time frame and by the dates communicated to them by their course instructors, as indicated in the course syllabi or as indicated in the exam schedules published by the Office of Academic Systems and Registrar. Students may request a make-up exam on the basis of religious obligation, serious illness, or family emergency.

Examinations will not be rescheduled to accommodate travel, family plans, or employment commitments. Generally, a student who misses an exam without a pre-approved alternate arrangement will receive a zero (0) mark in that exam. All make-up exams must be given before the official close of the semester.

Religious Accommodation

Habib University recognizes that the examination schedule may conflict with some religious observations. In such cases, the University will make reasonable efforts to accommodate the affected students by providing alternative times or methods to attempt examinations.

Students should review the syllabus for each of their courses at the beginning of each semester to determine if personal religious observance may conflict with the scheduled exam(s). In the case of a conflict with a midterm examination, the student must submit to the instructor a statement describing the nature of the religious conflict, specifying the dates and times of conflict by the end of the semester enrollment period. If a suitable arrangement cannot be worked out between the student and the instructor, they should consult the concerned dean of the school.

In case of a religious conflict with a final examination, the student must submit a written statement to the instructor, the concerned program director, and to the Office of Academic Systems & Registrar.

In such a case, any approved make-up exam may be scheduled after the final exams period. If a student fails to follow this procedure or fails to give a timely notice of conflict and subsequently misses the exam, no make-up exam will be given and the student will receive a grade of zero in that exam.

Special Needs Policy

Habib University is committed to ensuring that all students have the opportunity to take part in educational programs and services and that no individual with special leaning needs or medical condition shall, solely by reason of the disability, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity. The University aims to provide this opportunity in a manner that meets national and international best practices. For more details and application procedure, refer to the Habib University's 'Reasonable Accommodations for Students with Special Needs' Policy.

Graduation Requirements

A student applying for graduation must satisfy all University requirements regardless of degree or major in which they are enrolled. Besides University requirement, they are required to fulfill program specific requirements identified by their respective programs.

Curricular Requirements

- University Liberal Core: A student must complete all requirements of the Habib Liberal Core, as described in the Course Catalog of the induction year.
- Minimum Cumulative Grade Point Average (CGPA): Students must have a minimum cumulative GPA of 2.33 at the time of graduation.
- Minimum Credit Hours Requirement for the Class of 2026[1]:

Program / Major	Minimum Credit Hours Requirement
Social Development and Policy	129
Communication and Design	128 (DES)/130 (COM)[2]
Comparative Humanities	124
Computer Science	130
Computer Engineering	134
Electrical Engineering	134

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[1] Subject to the requirements of the accreditation bodies, the minimum credit hour requirements may change for specific batches.

[2] Subject to concentration chosen, see section on Communication and Design for more details.

- Transfer of Credits: All transfer of credits must be processed in accordance with the Habib University Transfer of Credits Policy by the last day of enrollment of in the Spring semester of the fourth year.

For other curricular and program-specific requirements, please refer to the graduation requirement grid of the program in this catalog.

Intent to Graduate Submission Deadline

The deadline to submit the 'Intent to Graduate' form is the last day of enrollment in the Fall semester of the fourth year.

Declaration of Minor(s) Submission Deadline

The deadline to file a Declaration of Minor(s) is the last day of enrollment in the Fall semester of the fourth year together with the 'Intent to Graduate' form.

Good Standing

In addition to the aforementioned University requirements, a student must be in:

- Good Academic Standing as defined in the Academic Standing Policy stated in the Course Catalog and any subsequent addendums;
- Good Conduct Standing as defined in the Conduct Standing Policy.
- Good Financial Standing as defined by the Financial Standing Policy.

Using Habib University Technology Services

Habib University has on board the top-notch technologies to fulfill the pedagogical, instructional research, administrative and mission development needs alongside an eye on the future to ensure continual improvement.

The use of technology resources (infrastructure and service) is a privilege that is extended to members of the University community.

The IT resources mainly include

- A digital card for access to campus spaces,
- A unique digital ID (single ID and password for all applications),
- Dedicated Wi-Fi network, and local area network,
- Personal computers in labs and the library,
- Student portal,
- Oracle PeopleSoft Campus Management Solution
- Canvas by Instructure (Learning Management System),
- Panopto (Video Management System),
- Stellic (Degree Management System),
- Turnitin (formative feedback and originality checking system),
- Koha (library management system),
- Zoom (Video Conferencing System),
- Printers/Photocopiers,
- Service Desk (central point of contact for queries and issues pertaining to facilities).

As a user, students have access to valuable University IT resources, to sensitive data, and to internal and external networks. Consequently, it is important for students to act in a responsible, ethical, and legal manner. In general, acceptable use means respecting the rights of other computer users and the integrity of the physical facilities.

The University encourages the use of electronic communications to share information and knowledge in support of the University's mission of education, research, and public service, and to conduct the University's business. To this end, the University supports and provides interactive electronic communications services and facilities for telecommunications, mail, publishing, and broadcasting. A safe and civil environment is necessary for students to be successful in their educational pursuits.

In order to make the best use of the IT resources, an IT handbook (available on the Student Portal), and a dedicated webpage are accessible through university website to guide students through the essential IT systems and services.

Service Desk System

The service desk is the central point of contact for students for any queries and issue pertaining to facilities and services provided by the institution. The desk receives, processes and responds to service requests calls during business hours. Service Desk can be contacted through email at servicedesk@habib.edu.pk, via extension **4224** or by visiting https://servicedesk.habib.edu.pk/

HU community can visit the Help Desk on the ground floor of the library or N-300, 2nd floor administration office at campus during business hours.

Academic & Non-Academic Grievance

Academic Grievance

An academic grievance is a formal complaint made by a student regarding a problem or issue related to their academic experience at the university. This can include issues such as grade disputes, discrimination, or violations of academic policies. Habib University is committed to providing a method of redress for legally impermissible, arbitrary, or discriminatory practices. This procedure is meant to provide students an avenue for addressing their concerns not mentioned in other University policies and/or procedures.

Academic Grievance Resolution Process

The process for a student includes the following steps:

1. A student's first action should be to try to resolve the issue informally by speaking with the instructor involved. If the issue is not resolved, the student should proceed to speak to the relevant Program Director, and then the relevant Assistant Dean if the issue persists.

2. In case the issue cannot be resolved informally, the student can file a formal complaint or grievance using the University's online grievance form.

3. All academic grievances will be reviewed and referred to the appropriate office or committee for further investigation or action. Students may be required to provide additional evidence to support their complaint.

Non-Academic Grievance

A non-academic grievance refers to a complaint or dispute that arise due to either an inherent fault in a policy or procedure of the University or due to the failure of the institution to adhere to or administer its policies and/or procedures correctly, the Grievant suffered some significant harm or injury.

Non-Academic Grievance Resolution Process

The Office of Community Values & Services (OCVS) handles all the non-academic grievances and their resolution. Students should reach out to OCVS for all non-academic grievances by emailing cvs@habib.edu.pk.

Code of Conduct

The Habib University's Student Code of Conduct is a set of rules and guidelines that govern the behavior of students at the university. This code outlines what is expected of the students in terms of ethical and professional conduct, and includes guidelines on academic integrity, plagiarism, theft, dishonesty, vandalism, verbal and physical assault, public display of affection, cyberbullying and harassment, drug and alcohol use, and other issues.

Violations of the code of conduct can result in strict disciplinary action, including penalties, suspension or even expulsion. Habib University is committed to providing a safe and healthy learning environment to all of its community members in order to ensure their personal, emotional, social, professional, and academic wellbeing. The University is committed to fostering an environment of active citizenship where people fulfill their individual and collective responsibilities to maintain a safe, healthy and respectful environment.

Students are responsible individuals and members of the Habib University community. The Code of Conduct defines the general standard of conduct expected of students in accordance with the YOHSIN Values, and outlines a set of social norms or rules and responsibilities that all students must abide by. The Code applies to conduct violations that occur at the campus or elsewhere, namely University sponsored programs or activities and/ or events or activities where the alleged student was representing the University in any capacity. Students are expected to be aware of, and to conduct themselves in accordance with this Code.

The Student Code of Conduct applies to all students enrolled/registered at the University for any degree awarding Program or non-degree awarding program or activity.

Student Conduct Process

Any member of the Habib community may report instances of alleged misconduct to OCVS by filing an online incident report form. All incident reports will be reviewed and investigated as appropriate.

When an academic or non-academic conduct case is filed against a student, the relevant student(s) will be notified through email by the Office of Community Values & Standards. Student(s) need to respond to this notification and take the necessary action outlined in the e-mail. The detailed process can be found here in the student code of conduct document.

Students may reach out to OCVS directly with any questions by emailing at cvs@habib.edu.pk.

Prevention of Sexual Harassment Policy

Habib University exhibits a zero-tolerance behavior towards any form of harassment (whether sexual or not) committed through verbal, physical (online or offline) means or mode that takes place on campus or off-campus (where official capacity is identified).

The policy of the University has been designed to be in congruence with the applicable laws, rules and regulations of Pakistan. The laws being:

1. Protection of Women Against Harassment at the Workplace Act, 2010 and the Prevention of Harassment at the Workplace Amendment 2022
2. The Higher Education Commission Policy on Protection Against Sexual Harassment in Higher Education Institutions

Defining Sexual Misconduct:

Sexual harassment includes unwelcome verbal, written, or physical behavior of a sexual nature, targeted towards an individual because of that person's gender or based on gender stereotypes. Unwelcome behaviors include but are not limited to lewd jokes or remarks, verbal innuendos, repeated and unwelcome flirtations or advances, display of pornographic content with the intent to harass, indecent exposure, unwanted physical contact, threats of a sexual nature, repeated demands for an unwelcome romantic or sexual relationship and/or forced or non-consensual sexual contact. Sexual harassment also occurs when consent to unwelcome sexual advances is induced by blackmail with either positive or negative consequences for the victim's education, employment, working or learning environment. Harassment may also include creating a generally hostile or demeaning environment for working and learning as retribution when sexual overtures and advances are rejected.

Initial Reporting & Designated Reporting Officers for Harassment Cases

Whenever current members of the Habib University community (defined as currently enrolled students, alumni of Habib, faculty members or staff under current contract, or on authorized leave, or invited guests of Habib University) believe that they either have been, or may be becoming, the targets of sexual harassment or sexual misconduct, they should report the incident as soon as possible but no longer than 365 calendar days since the last incident of sexual harassment or misconduct. Complainants may choose to report either formally to the Habib University Sexual Harassment Inquiry Committee or they may initiate an informal conversation with a Designated Reporting Officer. If a formal report is filed directly with the Sexual Harassment Inquiry Committee, the Chair will refer the case to the appropriate Conduct Officer as outlined under this policy. In cases

where the Complainant wishes to pursue the informal route initially, they should report the matter and have confidential conversations with any of the officially Designated Reporting Officers listed below:

1. Ms. Qurratulain Raza,
    Manager, Learning Support Services
    Email: qurratulain.raza@habib.edu.pk

2. Mr. Shoaib Khan
    Assistant Director, Career Services & Alumni Office
    Email: shoaib.khan@habib.edu.pk

3. Mr. Yousuf Kerai
    Senior Lecturer, Comparative Humanities, Integrated Sciences & Mathematics
    Founding Director, Center for South Asian Music
    Email: yousuf.kerai@sse.habib.edu.pk

4. Dr. Humaira Qureshi
    Assistant Dean, Dhanani School of Science & Engineering
    Program Director, Integrated Sciences & Mathematics
    Email: humaira.qureshi@sse.habib.edu.pk

The complete policy pertaining to the education and awareness on prevention of sexual harassment can be accessed using the link: Habib University's Prevention of Sexual Harassment Policy.

The Habib Liberal Core

The classic liberal arts model demands that the total undergraduate experience includes exposure to a broad and inclusive range of existing forms of knowledge. Through the Habib University Liberal Core Curriculum, we ensure that all of our students, regardless of major, conform to this high educational aspiration. No well-educated person should remain ignorant of the insight and perspective offered by the humanities and social sciences, or inarticulate about the wonder of scientific and mathematical inquiry.

Habib University has chosen the Liberal Arts and Sciences model of education because of its commitment to the development of leadership as an essential goal. At the core of our institutional identity is our flagship Habib Liberal Core Curriculum that seeks to fulfill our motto of *Yohsin*: 'The worth of all humans is in the measure of their thoughtful self-cultivation.' As students mature, the Habib Liberal Core enables them to reflect on and articulate the most critical aspects of their experience in the world they inherit.

The Core begins with the systematic development of reading, interpretation, analysis, communication, and presentation skills that will continue to be honed throughout the students' undergraduate careers. The humanities and social sciences component of the curriculum is built around a multidisciplinary engagement with the history, structures, and features of the modern world. From colonialism to nationalism and the nation-state, from war to the global political economy, from the growth of modern media to science and technology, our Liberal Core is committed to a rigorous analysis and critical evaluation of modernity in all its complexity. An encompassing historical understanding is essential to a classic liberal education – one that our core curriculum provides with a critical modern edge.

The principle of *Yohsin* tells us that the cultivation of thoughtful self-awareness is an ancient and universal aspiration. What makes Habib University's Liberal Core unique is its simultaneous focus on Pakistan's distinctive intellectual inheritance and the enduring legacy of Western knowledge. To illustrate this commitment, all students are required to complete at least one course in a regional language. A mandatory Liberal Core course, *Jehan-e-Urdu* ('The World of Urdu'), investigates modern Urdu literature and criticism in order to illuminate crucial aspects of our modernity.

Finally, no modern education is complete without engagement with scientific thought. Science and scientific methods pervade all forms of inquiry as well as our everyday lives. The Habib University Liberal Core Curriculum includes mandatory courses in deductive and quantitative reasoning, natural scientific method and analysis, as well as the nature and place of science in modern societies.

The expanse and logic of the Habib Liberal Core are built on the seven *Forms of Thought/Action*. The seven *Forms of Thought/Action* that govern the Habib Liberal Core Curriculum have been adapted from Stanford University's Breadth Governance model to reflect the regional context. Below are brief descriptions and justifications of the *Forms of Thought/Action* that reflect and govern the curricular logic at Habib. All students are required to take a determined minimum of courses under each form of thought/action.

Historical and Social Thought (02 courses)

The extraordinary significance of historical and social knowledge in modern times arises from the unprecedented pace of change in modernity, as well as the growing complexity of modern societies. Across the disciplines, Habib University's faculty also demonstrate a remarkably coherent historical approach to both social scientific and humanistic knowledge. All students will be required to take a minimum of two (02) courses in *Historical and Social Thought*.

Philosophical Thought (02 courses)

The study of philosophy has traditionally been at the heart of all liberal core curricula. Philosophical thought serves to enhance the reflective powers of the student, which is essential to concept-generation and innovation in all fields. Furthermore, an understanding of the philosophical depth of a tradition is crucial to a shared sense of inheritance. The Habib University faculty also widely share an interest in philosophy/theory. All students will be required to take a minimum of two (02) courses in *Philosophical Thought*.

Language and Expression (02 courses)

The development of linguistic and expressive abilities is widely recognized to be a key benefit of a liberal arts education, and language and literature have traditionally been as central to liberal core curricula as philosophy. Communicative power is one key to achieving success in all fields and disciplines. All students will be required to take a minimum of two (02) courses under this rubric.

Formal Reasoning (01 course)

Deductive thinking is crucial across fields and disciplines in both science and engineering, as well as the social sciences and humanities, and a deductive reasoning requirement is standard in higher and liberal education. Such a requirement also reflects the strength of our science and engineering faculty at the University. All students will be required to take a minimum of one (01) course in *Formal Reasoning*.

Quantitative Reasoning (01 course)

Numbers and quantities are an essential part of modern civilization and its forms of knowledge. Quantitative reasoning is the ability to interpret and contextualize large amounts of data, and is an essential skill in virtually all professions. All students will be required to take a minimum of one (01) course in *Quantitative Reasoning*.

Natural Scientific Method and Analysis (01 course)

The development of scientific method and analysis is a fundamental feature of modernity and its forms of knowledge. A natural science requirement is standard in higher educational and liberal institutions. To ensure the scientific literacy of all our graduates, students will be required to take a minimum of one (01) course in *Natural Scientific Method and Analysis*.

Creative Practice (01 course)

Creativity is increasingly recognized as an important indicator of success, and it is often a required feature of the best higher educational curricula. Given the nature of our programs and faculty in both the School of Arts, Humanities, and Social Sciences (AHSS) and the Dhanani School of Science and Engineering (DSSE), we have an excellent opportunity to make creative practice a distinctive feature of the HU experience. All students will be required to take at least one (01) course under this rubric.

The above core requirements are fulfilled through a combination of compulsory and elective courses. Given the University's unique pedagogical mission, we are committed to a common curricular experience for the HU student body.

The Habib Liberal Core Curriculum requirements are fulfilled through the following courses.

Forms of Thought	Courses
Historical & Social Thought (02 courses)	CORE 102 What is Modernity? CORE 201 Pakistan and Modern South Asia
Philosophical Thought (02 courses)	CORE 202 Hikma I CORE 301 Hikma II OR *any Philosophy Elective designated by the University to fulfill this Form of Thought.*
Language & Expression (02 courses)	CORE 101 Rhetoric and Communication CORE 121 Jehan-e-Urdu
Quantitative Reasoning (01 course)	ENVS 102 Introduction to Environmental Systems OR MATH 108 An Introduction to the Practice of Statistics OR ENER 104/ENER 104L Renewable energy; Why, What & How? OR *any other course designated to fulfill this Form of Thought.*
Formal Reasoning (01 course)	CS 101 Programming Fundamentals OR CORE 111 Logical Problem-Solving OR *any other course designated to fulfill this Form of Thought.*
Natural Scientific Method & Analysis (01 course)	CORE 200 Scientific Methods OR CORE 203 Scientific Methods: A Biology Perspective OR *any other course designated by the University to fulfill this Form of Thought.*
Creative Practice (01 course)	All students are expected to take a university approved course in Creative Practice.

Course Descriptions

CORE 101 Rhetoric and Communication

The command of language and the ability to communicate effectively in speech and writing is essential to leadership. This is why eloquence in the broadest sense is one of the most highly valued benefits of a liberal arts education. The opening course in our Liberal Core is designed to develop the reading and presentation skills that our students will need throughout their lives. Our curriculum nurtures our students' rhetorical abilities throughout their college career, especially through the Liberal Core. *Rhetoric and Communication* is designed to first identify the different aspects of expression and eloquence as distinct and essential abilities, and to develop and improve them through application and practice.

Explaining the combination of powers involved in the ancient division of rhetoric into invention, arrangement, style, memory, and delivery, the Roman orator Cicero says in his classic text on rhetoric, De Oratore: "Since all the activity and ability of an orator falls into five divisions, he must first hit upon what to say; then manage and marshal his discoveries, not merely in orderly fashion, but with a discriminating eye for the exact weight as it were of each argument; next go on to array them in the adornments of style; after that keep them guarded in his memory; and in the end deliver them with effect and charm."

The material, classroom experience, and exercises of *Rhetoric and Communication* are designed to cultivate all five of these critical abilities, together with sophisticated reading skills. Class content will focus on compelling and relevant texts that anticipate the themes of the larger Liberal Core, and they are chosen to elicit opinion and encourage discussion and debate. As they develop their powers of reading seminal texts, students will practice and improve communication skills through regular writing assignments as well as presentations. *Rhetoric and Communication* will also feature the ethics of discourse and communication, so that tact and respect for the other become an essential part of students' experience and understanding of rhetorical ability.

CORE 102 What is Modernity?

No one in the medieval world thought they were 'medieval.' The belief that we live in a distinct period of world history – that of 'modernity' – sets us apart from all pre-modern peoples. It is a defining aspect of who we are, essential to our modern identities. It is thus imperative to the task of understanding ourselves and our world, and it is essential to the task of thoughtful self-cultivation. Habib University's pedagogical charter of *Yohsin* requires us to ask the questions: What is it to be modern? What is modernity?

Our 'modernity' is the very air we breathe. It encompasses, at an ever-gathering pace, all aspects of our lives. This is why the question of modernity has been a central concern across the range of disciplines and fields of the arts, humanities, and social sciences. This course will address the most important elements of our global and regional modernity today. Beginning with an investigation of the emergence of this unique *world-historical identity*, we then turn to the historical formation of key structures and features of the modern in the following domains: political modernity, economic

modernity, modernity and ecology, and modernity and religion. By the end of the semester the historical character and specificity of these foundational spheres of our present will be visible.

CORE 121 Jehan-e-Urdu (The World of Urdu)

This course is designed to fulfill our commitment to the vernacular, as well as to reap the potential of modern Urdu literature and criticism to illuminate decisive aspects of our modernity. Jehan-e-Urdu is a pedagogically dynamic course that will rapidly advance students' appreciation and knowledge of Urdu through engagement with powerful texts of prose and poetry selected to speak to the concerns of the student today, opening up Urdu as a living world of insight and thought.

CORE 200 Scientific Methods

How do we make decisions? How do we evaluate information? Should we trust all information? How should we decide which information is trustworthy? How do we recognize the limitations of a claim? These matters are not only for practicing scientists but form an important part of our daily lives. At a time when information is more easily accessible than ever before, how do we intelligently utilize available information in making choices? How should we develop our evidence-based decision-making skills? This course builds on the foundations of scientific methods of inquiry and works to apply them to our everyday lives. Utilizing a wide array of examples, it illustrates scientific methods and their applications.

CORE 201 Pakistan and Modern South Asia

Nation-states – including that of Pakistan – emerged in the region of South Asia in the middle of the 20th century. How did such a world-historical event come about? What has it meant for the peoples of this region? In short, what is the history of our present – what is the history of our regional modernity?

This question takes on a particular urgency in Pakistan as the region passes through the current period of crisis and change. With a significant focus on the emergence and trajectory of Indo-Muslim nationalism and the creation of Pakistan, this course will be an overview of the modern history of South Asia from the immediate pre-colonial historical scene, through the colonial period, including the rise of anti-colonial nationalism and decolonization, to the Cold War and the contemporary period of transformation and turmoil.

Apart from the main outlines of the history of modern South Asia, students will also learn to place the region's colonial modernity within the larger framework of modern history. Students will learn to identify major features of the colonial economy, politics, and society under which – especially after the Great Rebellion of 1857 – regional religious and other social reform movements emerged, nationalisms formed, and the dramatic transformation of regional languages and traditions took place, processes that continue into the present.

Students will learn to see contemporary conflicts, ideologies, identities, and structures as specific to the modern period rather than as natural cultural expressions, and they will begin to see regional cultures and societies themselves as historical entities.

CORE 202 Hikma I – History of Islamic Thought

After the interrogation of modernity in Core 102 and 201 in particular, Core 202 turns to a second metatheme of the Habib Liberal Core Curriculum: *the question of inheritance.* Ranging across philosophy, literature, history, law, and the arts, *Hikma I* is an encompassing survey of Islamic thought that seeks to give a sense of the historical and philosophical complexity and depth of the tradition, with significant reference to the region of South Asia.

In the module on 'Religion & Modernity' in CORE 102, and subsequently in our historical survey of socio-religious as well as nationalist reform and revivalist movements in the colonial period in CORE 201, students study the dramatic transformation and discursive constitution of 'religion' and 'culture' in the colonial-modern period. Both regionally, as well as in the global modern generally, 'Islam' and its cultures and societies, have also become particularly sensitive and difficult regions of the discursive landscape.

CORE 203 Scientific Methods: A Biology Perspective

There are millions of problems in the natural world around us. Despite our best efforts, our perceptions of the problems and proposed solutions can be deceiving without facts and data to back it up. As a responsible member of the society, it is our duty to ascertain what is good for the planet and the human race and in order to make rational decisions, a scientific approach is invaluable. This course cultivates a step by step understanding and application of the scientific methods approach, predominantly from a biological science perspective. Using these skills, students get an opportunity to investigate and develop explanations for an original and relevant natural science research question.

SCHOOL OF ARTS, HUMANITIES & SOCIAL SCIENCES

Social Development and Policy

BSc (Honors) Social Development and Policy

Faculty

Aaron Patrick Mulvany	Associate Professor & Program Director
Shama Dossa	Associate Professor
Noman Baig	Associate Professor
Aqdas Afzal	Assistant Professor
Coline Ferrant	Assistant Professor
Muhammad Aatir Khan	Assistant Professor
Sahaab Bader Sheikh	Assistant Professor
Farhan Anwar	Assistant Professor of Practice
Mohammad Moeini Feizabadi	Senior Lecturer
Tajreen Midhat	Lecturer
Ana Tawfiq Husain	Dean's Fellow and Lecturer
Mahso Gichki	Dean's Fellow and Lecturer
Zaineb Makati	Dean's Fellow and Lecturer
Sana Rizwan Gondal	Dean's Fellow

Vision

The Social Development and Policy (SDP) Program at the Habib University is the first program of its kind in Pakistan. The Program intends to nurture an inter-disciplinary and comprehensive understanding of the complex problems of development and social change. The SDP Program equips

its students with a thorough theoretical understanding together with hands-on and practical training. In addition to this, recognizing the complexity of social, economic and developmental issues, the Program seeks to offer courses that address such issues from a variety of perspectives. The Program both integrates and builds upon traditional social sciences disciplines like anthropology, economics, political science and sociology.

The Habib University SDP program represents truly an innovative and dynamic approach to some of the most important issues faced by our society both locally within the communities of our cities and rural areas; domestically in Pakistan as a whole; and beyond that in the international and global community we all inhabit.

"Development" has become a principal idea of our times and an object of aspiration for individuals, communities, and governments alike. One of the key questions we grapple with in the program is "How can we examine and engage with development as a multi-faceted process of social, economic, and political transformation while attending to context and ethical practice?" Responding to this key concern, the central vision of the Social Development and Policy (SDP) program at Habib University is to nurture an inter-disciplinary and comprehensive understanding of development and social change — one that is firmly rooted in an ethic of care and grounded in a sense of place. A careful, place-based understanding is deeply connected to the love of knowledge. Moreover, this sensibility is fundamentally tied to Habib University's philosophy of Yohsin, the practice of thoughtful self-cultivation.

To fulfill this vision, the undergraduate major in Social Development and Policy combines rigorous classroom training in the social sciences and humanities with reflective, experiential learning through a practicum and practice-based courses. The first program of its kind in Pakistan, it aims to give students new ways to approach the challenges of development at home and abroad. Students are exposed to seminal ideas in social and economic thought that will enable them to understand and critique the processes of economic growth, development, and social change. They explore how major development concerns such as poverty, gender inequality, urbanization, and human rights are shaped by historical forces and processes of political power, while also examining the role of states, development institutions, markets, and civil society in shaping human well-being.

The program integrates perspectives and skills drawn from a wide range of disciplines, including anthropology, history, economics, sociology, political science, religious studies, philosophy, literature, and Environmental Studies. In this way, the program equips students with inter-disciplinary thinking and analytical skills that will allow them to understand and tackle a range of problems and challenges in their professional and scholarly careers.

Offering critical insights into the core values of development and progress, the SDP major will train a new generation of social scientists who – like the best development practitioners – incorporate lived experience and vernacular sensibilities into policy design at the national and international levels.

Program Learning Outcomes

Students who graduate with a degree in Social Development and Policy will be able to:

1. Formulate appropriate research methods to pursue and produce meaningful social research.
2. Clearly and appropriately communicate disciplinary content across multiple media and to multiple audiences.
3. Synthesize multiple ways of knowing the lived environment and the experiences of the people who inhabit them.
4. Critically assess and/or design development, policy and other social interventions.
5. Recognize and appraise the formal and informal structures that organize and regulate societies.
6. Justify development practice and theory using a social justice perspective.
7. Reflect upon and critically assess one's own practice and the practices, theories and methods in a chosen field.

Requirements for the Major - Class of 2026

All students majoring in Social Development and Policy are required to complete a total of 37 courses (129 credit hours). Students must maintain a minimum grade of C+ (2.33 GPA) in SDP major credit requirements in order to graduate with this degree.

The courses are divided in the following categories:

University Requirements

All students are required to take **ten** courses spanning seven forms of thought and action, called the Habib Liberal Core. Some courses in the major can also be counted towards meeting requirement of certain forms of thought in the core. For more details, please see the section on Habib Liberal Core in the catalog.

SDP Program Core

All SDP majors must complete the Social Development & Policy core curriculum consisting of **nine** courses.

1. SDP 101 Development and Social Change
2. SDP 103 Social Theory I
3. SDP 201 Qualitative Research Methods
4. SDP 202 Quantitative Research Methods
5. SDP 204 Public Policy I
6. SDP 206 Social Theory II
7. SDP 302 Data Analytics
8. SDP 303 Public Policy II
9. SDP 3xx/4xx International Political Economy Elective

SDP Program Electives

Students must complete a minimum of six SDP electives, including at least two upper-level SDP electives (300- or 400- level).

Summer Practicum

The major purpose of the practicum is to enable students to acquire skills and competencies in their interaction with individuals, communities, development agencies, and organizations. Moreover, students are expected to contextualize their learning as the practicum allows students to select agencies working on a range of thematic areas. Students will complete a specified number of hours and meet other practicum requirements. Although every practicum experience will be different, learning outcomes will include building networks, engaging in advocacy, and working with various stakeholders

All SDP majors are required to complete a Practicum, which is an application of the skills and competencies learned in SDP program. This Practicum must be a minimum of six (06) weeks and can be broadly construed in consultation with an assigned practicum adviser.

Capstone / Research Seminar

All senior students in the Social Development and Policy program must enroll in at least one (1) Senior Research Seminar coded at the 400-level. For most students, successful completion of the requirements of this course will fulfill the capstone requirement.

Thesis

Students desiring more rigorous research may pursue a thesis, which will be completed as an independent, supervised study completed in their final semester. Students pursuing the thesis, must have a minimum CGPA of 3.5. Thesis is a much more substantial research project in which the student will explore a topic, building on existing knowledge by using qualitative and/or quantitative techniques. Thesis writing is an exercise in developing in-depth research that speaks broadly to the social, cultural, and/or economic issues of contemporary societies. The Honors Thesis must be guided by a committee comprising of at least one (01) faculty member. Students intending to complete an honors Thesis must declare their intention at the beginning of their final academic year and submit a prospectus at the end of their penultimate semester. To be considered for a thesis with distinction, a student must enter their final semester with a minimum CGPA of 3.5 and have earned a minimum grade of A- in both their senior/research seminar and thesis.

Regional Language Requirements

All students at Habib University must complete CORE 121 *Jehan-e-Urdu*, as part of the Habib University Liberal Core requirements. All SDP majors must also fulfill a vernacular language requirement by successfully completing at least three (03) sequential courses in a single language, for example Sindhi or Punjabi. For full language offerings, refer to the Comparative Humanities Program Section in this Catalog.

Requirements for the Social Development & Policy Major (Class of 2026)

Course Category	Course	Min. No. of Courses	Min. Credit Hours
University Requirements	Habib Liberal Core	10*	32*
SDP Program Core	SDP 101 Development and Social change	01	04
	SDP 103 Social Theory I	01	04
	SDP 201 Qualitative Research Methods	01	04
	SDP 202 Quantitative Research Methods*	01*	04*
	SDP 204 Public Policy I	01	04
	SDP 206 Social Theory II	01	04
	SDP 302 Data Analytics	01	04
	SDP 303 Public Policy II	01	04
	SDP 3xx/4xx International Political Economy Elective	01	03
SDP Program Electives	Any SDP Electives (at least two upper-level electives)	06	18
Field Practicum	FP/SDP 302 Field Practicum	01	04
Regional Language Requirement	Three sequential courses in a vernacular language	03	12
Capstone / Research Seminar	Research Seminar + Capstone Report/Thesis Proposal	01	03+ 01
Upper-level Elective OR Thesis	For Capstone: SDP Upper-level Elective For Thesis: SDP 493 - Thesis	01	03
Electives	AHSS Electives (*non-SDP)*	02	06
	University-wide Free Electives	05	15
	Overall	**37**	**129**

*SDP 202 Quantitative Research Methods fulfils Quantitative Reasoning Form of Thought requirement of the Habib Liberal Core.

Social Development and Policy Minor

All Habib University students choosing to pursue the SDP minor must complete a minimum of five (05) courses totaling at least 18 credits. Requirements to complete the minor can be found in the 'Minors' section of the Course Catalog.

Course Descriptions

The SDP Major offers a total of nine (09) program core courses for Class of 2026, that are listed below.

Required Courses

SDP 101 Development and Social Change

Credit Hours: 4
Prerequisites: None
Fulfils: SDP Core

This is an introductory course in social development and provides an overview of ideas, theories, and concepts as well as a discussion on critical development challenges. This includes issues of urbanization, food security, migration, intersectionality and gender, as well as wars disasters and conflict. The purpose of this course is to answer key questions about development and social change by introducing students to the history, theory, and the contemporary practice of development. The concept of 'development' will be defined within the broader field of social sciences. We will be shifting the analytic focus from instrumental outcomes of development policies to the meanings, implications, and consequences they have as expressions of societal beliefs and values.

SDP 103 Social Theory I

Credit Hours: 4
Prerequisites: None
Fulfils: SDP Core

Social Theory provides students with the appropriate tools to make sense and understand social reality. The ultimate goal of Social Theory is to enable students to elaborate, propose and carry out principled and reasoned interventions in different contexts, in this way firmly linking reflections on social theory with practice in policy planning and making. Questions central to this course is:

1. What do we mean by theory and why do we use;
2. What do we mean by social reality, and what are its main features and characteristics;
3. What is the role of theory and theorization in appreciating social reality;
4. What is the context dependent features of social theorizing, with specific attention to the historical milieu and geographical origin that characterize different social theories; and
5. What is the impact that theories themselves exert on social reality?

Students will gain a general understanding of the central arguments and key concepts developed by western thinkers in social theory post-Enlightenment. As these theories, for good or ill, form the foundation of the social sciences and nearly two centuries of social-scientific thought, familiarity with major thinkers and their genealogies is essential to understanding their growing critiques from the Global South from the second half of the twentieth century onward, to be explored in Social Theory II.

SDP 201 Qualitative Research Methods

Credit Hours: 4
Prerequisites: SDP 101 – Development and Social Change
Fulfils: SDP Core

Combining theory and hands-on practice, this course will expose students to key approaches and methodologies of qualitative research methods in the social sciences. Students will understand when and how qualitative research methods are used and combined. They will learn and practice a variety of methods and tools including participant-observation, interviews, focus groups, and discourse analysis. Alongside, they will study and debate the ethical complexities of conducting scholarly research and implementing both research and development projects.

SDP 202 Quantitative Research Methods

Credit Hours: 4
Prerequisites: None
Fulfils: SDP Core, Quantitative Reasoning Form of Thought for Habib Liberal Core

Quantitative Research Methods will introduce various techniques of quantitative analysis used within social sciences. This is a foundational course to teach basic mathematical and statistical techniques used in social science research. Students will cover several topics including functions, graphs, mathematical relationships, and statistics and probability, among others, to best equip students with analytical methods for use both in the classroom and the field with a specific focus on survey research. This course will also prepare students to take higher level quantitative research methods courses offered in the program.

SDP 204 Public Policy I

Credit Hours: 4
Prerequisites: SDP 101 – Development and Social Change, SDP 201 – Qualitative Research Methods, SDP 202B – Quantitative Research Methods, and SDP 203 – Social Theory I
Fulfils: SDP Core

This is a foundational course on public policy, serving as one of the mandatory core classes in the Social Development and Policy Program. While students were introduced to the importance of development policies in Development and Social Change, this has served primarily to uncover social, cultural, economic or political implications of policy instruments themselves. This course however is aimed at the link between policy and governance, notably on the processes of policy making, on

the roles of government agencies/departments and on the administrative aspects of policy design, implementation and audit/evaluation.

The purpose of this course is to provide students with a critical and rigorous introduction to the world of public policy. This involves understanding the institutional context of public policy making, fundamentals of policy discourse, and key debates, surrounding policy writing, development, implementation and evaluation. The course aims to deepen students' understanding of public policy processes that are constrained by complex interactions between political preferences, institutions, and limited resources.

SDP 206 Social Theory II

Credit Hours: 4
Prerequisites: SDP 103 – Social Theory I
Fulfils: SDP Core

Building on Social Theory I students will gain a general understanding of the various "critical turns" that have occurred in social theory in the second half of the 20th and beginning of the 21st century. From the post structural to the postcolonial, from feminist to queer, the theories explored in Social Theory II represent both expansions and critiques of so-called "classical" European social theory. Students are challenged to become more critical and reflective of their own subjectivity and its effects on the research they do.

SDP 302 Data Analytics

Credit Hours: 4
Prerequisites: SDP 202B – Quantitative Research Methods
Fulfils: SDP Core

The prevalence of data including big data into every facet of our lives and the key role data has in decision-making by humans for themselves and the planet's future, has brought forth a dire need for statistical literacy and strong data analysis skills.

This course builds upon the theory and applied skills learnt in the 200-level Quantitative Research Methods course. Using basic concepts of statistical estimation and hypothesis testing students will learn the fundamental ideas of data analysis methods. It takes students behind the scenes and exposes them to the machinery underlying regression methods and teaches them how to diagnose and correct for real world data issues. Using statistical software, students will have the opportunity to apply various techniques to correct for situations in which model assumptions fail, conduct program and policy evaluations and perform data simulations.

SDP 303 Public Policy II

Credit Hours: 4
Prerequisites: SDP 101 – Development and Social Change, and SDP 204 – Public Policy I
Fulfils: SDP Core

The program of Social Development and Policy aims to ensure that students have a broad understanding of the policy fields that intersect with social, economic and environmental aspects of development. Students were first introduced to the importance of development policies in the course Development and Social Change. In the course PP1, they were exposed to the various theoretical constructs that have evolved to understand the complicated and multi-dimensional political arena defining the political economy and public policy space. They related that understanding with real life policy scenarios to further refine their comprehension on the subject.

Building on these courses, Public Policy II focuses on governance mechanisms employed by governments that are shaping public sector delivery. They will get an understanding of the instruments constructed in the policy formulation and decision-making processes such Policy Briefs, Policy Papers and Legislative Acts. The course also aims to provide an opportunity for students to learn specific fields of public policy with direct bearings on social development, locally and globally. Students who are interested in the field of policy studies are encouraged to take complementary courses in the stream of governance and policy making in order to garner greater depth of understanding diverse fields of social policy.

SDP 3xx/4xx International Political Economy Elective

Credit Hours: Minimum 3
Prerequisites: SDP 101 – Development and Social Change, SDP 201 – Qualitative Research Methods, and SDP 202B – Quantitative Research Methods
Fulfils: SDP Core

Students majoring in SDP will have to fulfil this requirement as a mandatory elective, by completing one third-year elective course, which tackles the dynamics of *International Political Economy*. Various options will be offered yearly to allow students to complete this requirement.

SDP Electives

ANT 101 Introduction to Cultural Anthropology

Credit hours: 3
Fulfils**:** SDP Elective & AHSS Free Elective

The course introduces students to the intricacies of human cultures and highlights the interlacing of cultural patterns with the forces of modernity. For instance, how do gift-exchange practices of local communities help us understand the politics of international aid? How do rituals of magic explain the commodity fetishism of capitalism? Does understanding cultural theories of identity help us rethink notions of the modern developmental subject? Does tribal social organization undergird or conflict with the modern nation-state? Addressing questions like these will provoke students to think critically of culture as an important tool for making sense of patterns of contemporary social development.

ANT 412 Anthropology of Trade

Credit hours: 4
Fulfils: SDP Senior Research Seminar/ Capstone

The trade has a long history in human civilization. From camel caravans to economic corridors, from shipping to air cargo, trade has been seen as a social and an economic process of connecting people, places, and ideas together. While it has formed a complex web of commodity flows in the last two hundred years, trade has also brought misery and agony to millions. The infamous 'Triangular Slave Trade,' for example, that operated from 16th to 19th century in the Atlantic was the darkest period of abduction, ransom, and looting, that human has ever seen. In the last few decades, especially with a massive Chinese One Belt One Road project, we are witnessing a renewed significance of trading. In Pakistan, the Chinese Pakistan Economic Corridor known as CPEC has already generated an imagination for a better future among the middle class of the country. It has become a mantra among the ruling elite the more we exchange things the more peace it will bring. For instance, trading is dubbed as a panacea for India Pakistan rivalry. While such macro level trading happens between states, the more grounded trade such as khaip in South Asia, kula ring in Micronesia, and potlatch in British Columbia shows different modalities of exchange at an everyday level. These exchanges are not always guided by rational economic models of self-maximization. Rather it operates on a different principle of reciprocity that does not get easily mapped onto economic principles.

Within this context, this course seeks to explore a cultural logic of exchange. It investigates what noneconomic factors, apart from monetary gains, shape exchange of things. Under which value system do people reciprocate? The objective of the course is to rethink the ways in which economics has been practiced on an everyday basis. In the first few weeks, students will read some of the classical anthropological scholarship on exchange. The second module focuses on historical trade networks, and explores how commercial networks have been shaping the cultural and geographical imaginations in the region. Finally, in the last few weeks, students will investigate trade through commodities such as "people," sugar, and cotton.

DEV 200 Development and Environmentalism

Credit Hours: 3
Fulfils: SDP Elective

This is an introductory course and it will provide an introduction to ideas, and theoretical debates about environmentalism and how it is variously perceived and understood. The course critically examines the development of environmentalism as a global issue, and its implications for economic and social development in the 'South'. This course will not look at environmental problems from the lens of physical environmental science. Instead, it will be a political analysis of environmental problems and the implications on social and economic development in the South.

DEV 211 Food Security

Credit Hours: 3
Fulfils: SDP Lower-level Elective
Pre-requisites: SDP 101 Development and Social Change

Something as basic as the food on our plate is political. It is a reflection of the historical processes that have shaped the political economy of food. Yet, more often food takes a peripheral place in our predominant understandings of the global political economy. This course is a critical exploration of the food that makes it to our plates, the geographies it encounters, the people who are involved in its production and the processes that have shaped the global food system.

The course aims to provide a critical perspective on the global food system. It begins with an exploration of the concepts of food security and food sovereignty, and how they are intrinsically tied to vulnerability and poverty. The course provides a historical overview, discussing the ways in which colonization, industrialization and the increasing corporatization have shaped access to food. It also focuses on how neoliberalisation is redefining agrarian societies, and the resistance such processes continue to face. The course explores the global food system from an intersectional role where race, class, gender, indigeneity, geographical locations play a crucial role in determining inequities within the global food system.

DEV 212 Urban Sustainability

Credit Hours: 3
Fulfils: SDP Lower-level Elective

The Course finds relevance in exposing the students to the emerging paradigm in urban development that places core focus on sustainability where interfaces get created between the economic, environmental and equity-based dimensions of sustainable urban growth and development. The wider arena provided by the supporting curriculum finds synergy with the course in that understanding of public policy, research based participatory planning, social, economic and environmental considerations of sustainable development and issues of ethics, social justice and inclusivity all find a space in the narratives and practices that will define the course content. The overriding rationale for the course is reflected in the realization that a new understanding and treatment of the 'urban' is critical to ensuring the sustainability of human growth as cities provide the battlegrounds for our fight against challenges such as climate change that pose an existential

threat to humankind. The urban construct provides a rich space for the academic and professional realm that the students can explore and their knowledge base needs to encompass the face of the future cities.

DEV 229 Gender Inclusion & Analysis in Development Policy

Credit Hours: 3
Fulfils: SDP Elective

Why are females head of the states so popular in fighting with the COVID pandemic? Why is there so much resentment against inclusion of women in economic life in developing world? As Policy makers what are we missing as a developing country in terms of gender in policy making? In order to answer these and many other important questions related to gender and development policy, this course explores the gender dimensions of economic life by introducing students to the rich body of research on gender-aware analyses of household economics, violence against women, work (paid and unpaid), labor markets, poverty, inequality, public policy, markets development, formal and informal employment; policies addressing work-family life balance and social issues by looking at developed and developing countries as examples. The focus of this course will be on history of women empowerment and inclusion or exclusion of gender in mainstream policy making, how the 21st Century policy making is tackling these issues in development practice and how fruitful are the results. In short, this course will equip you to look at policy making at micro level by introducing you to very important issues of gender and how to fight them.

DEV 322 Advanced Development Practice: Program Planning and Design

Credit Hours: 3
Fulfils: SDP Upper-level Elective
Pre-requisites: SDP 201 Qualitative Research Methods/ SDP 202B Quantitative Research Methods

A key skill set for all those who would like a career in social development and policy is learning how to design, assess and implement a good quality funded development program/project. This development practice course provides students with an opportunity to develop practical skills in program and project planning and design through a step-by-step process. The course is designed around the theme of Sexual and Reproductive Health (SRHR). Proposal development requires both subject knowledge and technical skills for how plan implement an idea. Therefore, the course will build capacity of students on the subject area of SRHR in conjunction with program planning and design skills.

DEV 327 Post Development and Alternatives to Development: Critical Theory, Policy and Practice

Credit Hours: 3
Fulfils: SDP Upper-level Elective

Post-Development/ De-growth Development and Alternative Development, challenges the very foundations of development theory and policy as being Eurocentric and constituting relations of power between those defined as 'developed' and as 'underdeveloped'. They propose 'alternatives to

development' to be found in grassroots movements and indigenous communities with a focus on de-colonial and de-growth economic structures which go beyond the Western models of the economy, politics and knowledge. This course explores alternative development options, those that lie outside of mainstream development practice and brings alternative routes to development in areas of Feminism, Gender Equality, Health, Climate/ Environment, Politics, Spirituality, Reparations and Preserving Cultures.

This seminar will deal with some of the main texts of post-Development, its variants and proposed alternatives, but also with the sharp criticisms raised against this school by development theory, with empirical examples from Latin America, Africa, Asia, Middle East and Europe.

ECON 101 Principles of Microeconomics

Credit Hours: 3
Fulfils: SDP Lower-level Elective

Economics studies the social construction of the material side of our life. A focus on production and exchange distinguishes economics from other social studies focused on culture (the concern of anthropology), government and state policy (political science), or social networks (sociology). Focusing on the social organization of production and exchange distinguishes economics from engineering and psychology. Economics examines production as a social process where people work with each other, often exchanging or sharing the products of their labor. In microeconomics, we focus on how individual economic decision makers -- households, firms, workers, and the government – make economic choices and how these decision makers interact with each other through markets and other social institutions such as class. Our goal in this course is to take some initial steps towards understanding how each part of the economic system works, how the parts work together, and to apply this knowledge to a broad range of social and economic issues.

ECON 121 Principles of Macroeconomics

Credit Hours: 3
Fulfils: SDP Lower-level Elective
Prerequisites: ECON 101 Principles of Microeconomics

Macroeconomics is the attempt, throughout history, to understand phenomena such as unemployment, inflation, the business cycle and economic growth; and how governments, through fiscal and monetary policy, have addressed these issues. Following the quote above, we study the issues and ideas of macroeconomics in a variety of perspectives: through theoretical models, the history of economic thought, economic history, philosophy, economic data, and politics. Each perspective has its own contribution to make to our understanding of the economy. An introductory course such as Econ 121 is intended to expose you to the variety of ideas and approaches under the heading of "Principles of Macroeconomics".

ECON 222 Environmental and Natural Resources Economics

Credit hours: 3
Fulfils: SDP Lower-level Elective
Prerequisite: SDP 101 Development and Social Change

According to Global Climate Risk Index (2019), Pakistan was the eighth most-affected country by extreme weather events for the period 1998-2017. At the same time, Pakistan's environment and natural resources are facing a lot of pressure from the country's significant population growth. Linkages between climate change, the ecology, natural resources and economic growth necessitate a careful analysis of how humans utilize natural resources—drawn from the ecological system— for economic production so that the rate of climate change can be mitigated, while also ensuring the conservation of the ecology as well as natural resources. This course will focus on using an economic perspective to carefully analyze the mentioned linkages. Some topics that will be covered include: climate change, resource and pollution management models, sustainable development and economic growth. Students will also be required to develop the expertise of conducting benefit/cost analysis using various methods, including Net Present Value (NPV).

ECON 435 Theories of Social Capital and Civil Engineering

Credit Hours: 3-0 or 3-1
Fulfils: SDP Upper-level Elective
Prerequisites: SDP 101 Development and Social Change, and SDP 201 Qualitative Research Methods

Social capital refers to the ways in which people create social networks and social relationships, and the trust and norms of engagement that underlie social interactions. Networks and trust are forms of social capital, which generate social solidarity and inclusion. They knit communities together, laying down the negotiated basis of social life, where people support and do things for each other, which in turn, provide ground for civic engagement, for political participation, for general economic productivity, all resulting in enhanced levels of social welfare.

At the first glance social capital seems to be a purely economic concept: as 'capital', it has an exchange value and can be accumulated and owned by individuals and communities, yet, it is intangible and has an ethereal quality since it flows in and between people. However, a deeper dive into the concept reveals to us that it is in essence a feature of social institutions, and as such must be studied in a multidisciplinary way.

This research seminar course provides an overview of social capital theory through a very multidisciplinary approach, with an emphasis on both on theory and empirical research. We will start by reading several classic texts authored by leading scholars in the field such as James Coleman, Robert Putnam, Mark Granovetter, Samul Bowles, Amitai Etzioni, and Alejandro Portes. Also, we will read selected passages from a classic text in this field, Democracy in America by Alexis de Tocqueville. We will discuss in a balanced way, the methodological and empirical aspects of theory of social capital; we will put some emphasis on quantitative research using survey data. Topics will include the role of social capital in decreasing rates of crime in urban neighbourhoods; impacts on labour markets and employment, on public health, and on economic activity.

SDP/CND 223/253 Introduction to QGIS in Research and Communication

Credit Hours: 3
Fulfils: SDP Lower-level Elective

We are the first generation to have a bird eye view of our planet, the space we occupy, the area we live and the places we visit. This puts us in a unique place to learn about it, protect it and represent it with justice!

Can we now imagine our lives without google maps? Do we ever plan a visit before checking the ETA? Aren't we all annoyed by the number of times different applications ask us about our location? Do we not all wonder why we call the North, North and South, South?

Reflecting on these questions will help you realize the significance of spatial data and Geoinformatics in our "Modern" lives. This on one hand creates opportunity to innovate, design and develop interventions which can make our lives better but on the other hand can also be misused and exploited. For example, the same spatial data can be used to design a map of health facilities and also to target them. This course will help you learn to read and consciously use geographical and spatial data, and justly represent our spatial realities.

The increasing availability of spatial data from different open data sources (including ESRI Open Data Hub and Natural Earth Data) has amplified its application in a variety of fields. GIS skills and their usage has overtime become discipline agnostic, providing a great utility to professionals across disciplines who use GIS based tools to make more informed decisions which are critical in making more inclusive and impactful solutions to some of the most complex problems of our time

SDP 3xx Time Series

Credit Hours: 3
Fulfils: SDP Upper-level Elective
Prerequisites**:** SDP 202B Quantitative Research Methods

Time series is the study of random variables that are correlated with each other over the course of time, i.e., a sequence of data in chronological order. It has wide range of applications in economics, banking and finance, sociology, political sciences, biology, neuroscience, meteorology, engineering and other disciplines. In this course we will use a range of methods, including visualization, illustration and formal explanation to both get an intuitive sense of time series data and study such data in a more formal way. We will study trends, seasonal patterns, and correlation of the same variables between two successive time intervals as some of the main features of time series data. We will also learn how to develop models useful for studying certain time-varying processes. Our overall goal is to study the behavior of random data in a dynamical setting.

SDP 411 Advanced Topic in Qualitative Research Design

Credit hours: 3-0 or 3-1
Fulfils: SDP Upper-level Elective/ Senior Research Seminar
Prerequisite: SDP 201 Qualitative Research Methods, and SDP 202B Quantitative Research Methods

This course is geared towards developing advanced skills in qualitative research design with a focus on three cutting edge approaches from a critical lens – feminist research; participatory approaches and arts in qualitative research. It builds on the introductory qualitative research course which focuses more on methods. This Course aims to provide a clear link for students between developing a research question; a theoretical lens; methodology; data analysis and representation. It is assumed that those registering for this course have relatively clear research question formulated which they think can be answered by a qualitative methodological approach. Students are expected to conduct an exploratory study and write a journal article styled research paper.

SDP 412 Applied Methods in Quantitative Research

Credit Hours: 3-0 or 3-1
Fulfils: SDP Upper-level Elective/ Senior Research Seminar
Prerequisites**:** SDP 202B Quantitative Research Methods, and SDP 302 Data Analytics

The modern world relies on evidence-based decision making. This course is designed to guide students through the process of conducting empirical research and producing research output. Building upon the theory and applied skills learnt in the 200-level Quantitative Research Methods and 300-level Data Analytics courses, this seminar course will help students design a quantitative research study and produce a well-written empirical paper.

This course together with Quantitative and Qualitative Research Methods and Data Analytics will form an ideal platform for students who want to go into research and development-oriented private or public institutions, or those who want to pursue graduate studies that demand sound research understanding and application.

RELS/ANT 100 Jamal: Islamic Aesthetic and Design

Credit Hours: 4
Fulfils: SDP Lower-level Elective

Designed as an experimental course for Habib University students, Jamal fuses thought and action, perception, and practice into a single class taught by an anthropologist, Dr. Noman Baig, calligrapher, Ustad Kashif Khan, and artist Ustad Rizwanullah Khan. Drawing on ethnographic and traditional learning methods, students will explore aesthetic in a broader cultural context. The students explore the formation of Islam art, the phenomenology of creative practice, iconocity in religious visual culture, and epigraphy on tombstones. Furthermore, the course seeks to inspire students towards beauty – one of the fundamental tenets of Habib University's core concept of *Yohsin*. It also fulfills a Liberal Core requirement of Creative Practice.

Communication and Design

BA (Honors) Communication and Design

Faculty

Zain Saeed	Assistant Professor and Program Director
Anum Asi	Assistant Professor
Christie Lauder	Assistant Professor
Muneera Batool	Assistant Professor
Rohama Malik	Assistant Professor
Sheikh Taha Munir	Assistant Professor
Behzad Khosravi	Assistant Professor of Practice
Hasan Reza Habib	Assistant Professor of Practice
Haya Fatima Iqbal	Assistant Professor of Practice
Rakhshaan Qazi	Assistant Professor of Practice
Ahsen Ali	Lecturer
Isma Gul Hasan	Lecturer
Mehwish Abid	Lecturer

Vision

The program in Communication and Design allows students to construct an interdisciplinary major in the arts and humanities that integrates historical investigation, critical analysis, aesthetic practice and social engagement. Our faculty are committed to engaging students in a conversation as much about the histories, theories and praxis of communication and design as about critical contemporary challenges that define our future.

Foundational courses in Communication and Design introduce students to a range of texts, movements, theorists, artists, designers, filmmakers, and writers from diverse cultures and historical periods, thereby training them in the close, comparative study of different artistic, cultural,

and social forms. Studio practice – broadly understood through the hands-on production of film and photography, illustration and type, animation and new media – forms an essential component of the first two years of coursework so that students can learn how to craft image and idea even as they refine their critical and historical sensibilities. Our graduates will be alive to the transformative capacities of media and design, and will learn to apply their expertise with deliberate care, purpose, and responsibility.

In short, our mission is to train thoughtful, articulate, sophisticated practitioners who exercise critical judgment in the creation of work that challenges preconceptions and generates discussion that effects positive change in the lived world.

Program Learning Outcomes

Students who graduate with a degree in Communication and Design will be able to:

1. Demonstrate an understanding of different practice-based approaches to developing appropriate interventions;
2. Deploy a diversity of research and methodological skills and tools to understand complex social and technological milieus,
3. Demonstrate a capacity to think beyond disciplinary epistemes and work collaboratively with other peers; and,
4. Demonstrate an awareness and sensitivity to the deeper and long-term systemic, praxical, ethical and political implications of their work through their exposure to theory.

Requirements for the Major – Class of 2026

A BA (Honors) in Communication & Design (CND) requires completion of 39 courses and with a minimum CGPA of 2.33. The program offers two concentration tracks (Primary and Secondary) – Design and Communication. If the primary concentration is in Design, then the secondary concentration will be in Communication and vice versa.

All students majoring in CND with primary concentration in Communication and secondary concentration in Design, are required to complete a total of 39 courses (37 + 1 summer practicum + 1 internship), 130 credit-hours requirements.

All students majoring in CND with primary concentration in Design and secondary concentration in Communication, are required to complete a total of 39 courses (37 + 1 practicum + 1 internship), 128 credit-hours requirements.

The courses are divided in the following categories:

University Requirements

All students are required to take **ten** (10) courses spanning seven forms of thought and action, called the Habib Liberal Core. Some courses in the major can also be counted towards meeting requirement

of certain forms of thought in the core. For more details, please see the section on Habib Liberal Core in the catalog.

Communication & Design Program Core

Communication and Design students, regardless of concentration take the same set of six (06) core courses, five of them within their first year.

Final Year Capstone Project

In the final year, all CND students will be required to complete a capstone project where they will take on a project of significant scope to work with through the final year of their major.

Primary and Secondary Concentrations

All CND majors will have a primary concentration in one area (either in Communication or Design), as well as a specialized secondary concentration in the other area.

Primary Concentrations	
Design	Communications

The primary concentration includes eight required courses and the secondary concentration requires four courses.

To fulfil secondary concentration requirements, students must take a minimum of 04 courses (03 lower-level electives and 01 upper-level elective).

Summer Requirements

Directed Study / Practicum

At the end of their second year, students from both concentrations do a one-credit summer Directed Study/Directed Practicum with a professor or industry professional.

Internship

At the end of their third-year students from both concentrations will undertake an 8-week internship at a partner organization or with an industry professional approved by the program.

Requirements for the Communication & Design Major (Class of 2026)

Course Category	Course	Min. No. of Courses	Min. Credit Hours
University Requirements	Habib Liberal Core*	10*	35*
CND Core (08 courses)	CND 101 Materials and Practices	01	04
	CND 102 Ideation and Processes	01	04
	CND 103 Introduction to Design and Media	01	04+01
	CND 104 Performing Narrative	01	03
	CND 105 Forms of Inquiry	01	02
	CND 402 Transdisciplinary Practicum	01	03
	CND 401 Capstone I	01	04
	CND 403 Capstone II	01	04
Primary Concentration in one of the two areas Design or Communications (08 courses)	**Primary Concentration in Communication**		
	COM 201 Production Fundamentals I	01	04+01
	COM 202 Communication and Culture	01	02
	COM 203 Production Fundamentals II	01	04+01
	COM 204 Elements of Aesthetics I	01	03
	COM 301 New Media and Journalism	01	04+01
	COM 302 Elements of Aesthetics II	01	03
	COM 303 Digital Media and Post-Production	01	04+01
	COM 304 Contextualizing Media	01	02
	Primary Concentration in Design		
	DES 201 Designing for Interactions	01	04+01
	DES 202 Design, Technology and Society	01	02
	DES 203 Designing for and with People	01	04+01
	DES 204 Research in Design	01	02
	DES 301 Systemic Design	01	04+01
	DES 302 Design and Social Change	01	02
	DES 303 Design Fictions and Provocations	01	04+01
	DES 304 Design Politics and Ethics	01	02

Course Category	Course	Min. No. of Courses	Min. Credit Hours
Secondary Concentration electives (04 courses)	**Secondary Concentration in Communication**		
	Lower-level COM elective	03	09
	Upper-level COM elective	01	03
	Secondary Concentration in Design		
	Lower-level DES elective	03	09
	Upper-level DES elective	01	03
CND Core – Summer Requirements (02 courses)	Directed Study/Directed Practicum[1] (Year 2)	01	01
	Summer Internship/Summer Research Project[2] (Year 3)	01	02
Electives (07 courses)	University-wide Free Electives	07	21
	Overall	**39**	**128-130**

* Courses may overlap leading to a different total number of courses and credit hours.

[1] Directed Study/Directed Practicum (1 Credit-hour) – 4-week apprenticeship with an industry professional or an individual media project. OR a 4-week research assistantship with a Habib professor.

[2] Summer Internship/Summer Research Project (2 CRH) – an 8-week internship with an approved industry organization or professional with a tangible plan and goal. OR an 8-week research project under the supervision of a CND professor (or approved external practitioner/ academic).

Communications Minor

All Habib University students from the Class of 2026 onwards except for CND Majors can pursue the Communications minor. Requirements of the minor can be found in the 'Minors' section of the Course Catalog.

Design Minor

All Habib University students from the Class of 2026 onwards except for CND Majors can pursue the Design minor. Requirements of the minor can be found in the 'Minors' section of the Course Catalog.

Course Descriptions

Required Program Core Courses

CND 101 Materials and Practices

Credit Hours: 4
Prerequisites: None
Fulfils: CND Core

Fundamental to practice in the creative art and design disciplines is the ability to see phenomenon in the real world differently, to be able to use observation as the basis for imagination and creative insight, and to materialize both observed and imaginary phenomenon into basic material and visual artifacts, or prototypes. This studio course aims to give incoming freshmen students the foundational skills, tools, and techniques in creative observation, ideation, and prototyping that they will build on in subsequent semesters in more advanced courses.

Students will be introduced to a range of drawing and prototyping techniques through a range of mediums. The course will start from basic 2D drawing and will transition after mid-semester towards technical drawing and crafting 3D models from various materials. Students will also cover foundational concepts and frameworks in working with gestalt relations, perspective, light, texture, color, framing etc., and engage with readings and important critical texts that introduce them to discourses in design around these concepts.

CND 102 Ideation and Processes

Credit Hours: 4
Prerequisites: None
Fulfils: CND Core

In this class, we will investigate and explore the creative process in order to generate ideas for art, tech and design projects and more. The course will show how different concepts, techniques, and methods can inspire, inform, and bring depth to what one ultimately creates and prototypes. Students will expand their arsenal of design and research skills, learn how to think critically about their audience, content, form, and processes, as well as, understand the importance of utilizing more than one research and design strategy. The course will introduce a number of tools and techniques through hands-on exercises and assignments to really drive home how iterative, messy and exciting the creative process can be.

CND 103 Introduction to Design and Media

Credit Hours: 4-1
Prerequisites: CND 101 – Materials and Practices, and CND 102 – Ideation & Processes
Fulfils: CND Core

Building on the knowledge and skills that students acquired during their first semester, this course focuses on combining design principles and research methods with digital forms of making. The course will introduce a number of tools and software through class exercises and assignments to

help students develop a strong conceptual and theoretical grounding, while the lab component will strengthen the students' technical skills.

The course is divided into two modules, namely, Image and Text and Time, Space and Sound. Module one will focus on understanding and exploring software like photoshop, illustrator and InDesign while module two will focus more on 3D and animation software like Sketchup, Premiere, Aftereffects, Audacity and Cinema 4D.

CND 104 Performing Narratives

Credit Hours: 3
Prerequisites: CND 101 – Materials and Practices, and CND 102 – Ideation & Processes
Fulfils: CND Core

This course introduces students to the nature, elements, and structure of narrative, through embodiment. Students will improvise and explore the different elements and vocabularies used in postmodern theatre to stitch narratives of their choice. In this vein, we will be using "Viewpoints" - a method for training performers, building ensembles, and creating movement for the stage. Working in tandem, we will be using "Moment Work" - a dramaturgical technique of improvising and devising theatrical narratives. Through Moment Work we will dissect the various elements of the stage (like acting, character, movement, props, costumes, lights, dialogue etc), and explore their narrative potential and narrative flexibility i.e. how they change meaning, significance and presence with the interaction of other elements of the stage. In the end, students will create devised and new works which could take the following forms: a theatrical play, performance installation, short film - which they will perform/exhibit for an external audience.

CND 105 Forms of Inquiry

Credit Hours: 2
Prerequisites: None
Fulfils: CND Core

This course provides a conceptual framework for several major developments in the arts and humanities extending from the close of the 19th century to the present. It will introduce students to texts, movements, and thinkers, with a focus on reciprocal influences, appropriations, and resulting hybrid forms that characterize much South Asian, European and American aesthetic work. Traversing between the two halves of the 20th century, this course explores various kinds of modernisms and avant-gardes in design, literature, cinema and visual arts, and the consequences of World War II on them. In addition, it examines the multiple ways arts have tackled political engagement and propaganda, and taken part in the progressive loss of centrality of the West in the global arena. Divided 3 into three parts, it focuses on nation-based case studies [Brazil, India and Pakistan, Japan] as well as on some of Europe's and America's most significant cultural contributions such as, Pop Art and Situationism.

CND 401 Capstone I

Credit Hours: 4
Prerequisites: None
Fulfils: CND Core

In this class, we will seek to investigate the processes involved in transforming our ideas via research and practice into things that exist in the world. We will dive deep into research in art, media and design, with the intention of using them to come up with novel ideas that complicate our understanding of the world, provide a solution to a problem, or simply help manifest our deepest obsessions in the form of representation in the physical world. We will seek to create a community within this classroom, as we discuss, argue, and reflect on the ideas of others with generosity, rigor, and in the spirit of encouragement, building up towards a comprehensive final research proposal for a project that will then be completed in Capstone II.

CND 402 Transdisciplinary Practicum

Credit Hours: 3
Prerequisites: None
Fulfils: CND Core

In addition to their capstone, we suggest a final studio course for their seventh semester, the transdisciplinary practicum, where all students come together once again to work on a significant semester long project in mixed groups. The idea behind this is to foster collaborative skills and have them all spend a final semester sharing what they've learned in their respective concentrations together. Being that this will be a significant four-month long project, it may also be the opportunity for them all to work on a project brought in from industry. The outcomes of working on an external project for industry would also fit the larger scope we have in mind for the transdisciplinary practicum. There could be a range of deliverables coming from each group that traverse design and media.

CND 403 Capstone II

Credit Hours: 4
Prerequisites: None
Fulfils: CND Core

In this studio students will continue and complete their major capstone project for the CND major.

Required Concentration Core Courses – Communication

COM 201 Production Fundamentals I

Credit Hours: 4

This is a 4 credit-hour studio course with a 1 credit-hour lab. This modular course will introduce students to the fundamentals of media production by focusing on individual skills that constitute the various steps in the production lifecycle, with a focus on how they all contribute to storytelling. This

course delves into the following areas in four modules: 1) Introduction to Production Fundamentals; 2) Writing for the Screen – Scripted narrative; 3) Introduction to Cinematography; and 4) Introduction to Sound.

COM 202 Communication & Culture

Credit Hours: 2

This is a 2 credit-hour seminar. This course introduces students to the conceptual frameworks, theoretical foundations and historic precepts that constitute the broader field of Communications Studies. Broadly looking at the intersection of society, culture, media production and consumption, the course aims to develop in students a sound fundamental understanding of the field as it exists today, as well as the journey it has taken to get there.

COM 203 Production Fundamentals II

Credit Hours: 4

This is a 4 credit-hour course and 1 credit-hour lab. The aim of Production Fundamentals 2 builds upon the knowledge gained from Filmmaking modules taught in Production Fundamentals 1 and introduces students to new media production skills they will need to complete the execution of their projects and in developing their practice as filmmakers. This course will focus on modules covering the fundamentals of Production Sound, an introduction to Documentary Production processes, an introduction to Directors creative vision, the basics of Post Production. The course will aim to Finish building the foundation of student's skill set of Filmmaking with the help of practical demonstrations, hands-on exercises, and in-class assignments, film projects, as well as foundational theoretical knowledge about these taught practices. Through its four modules the course delves into: 1) Writing for the Screen – Documentary Narrative; 2) Directing; 3) Digital Editing; and 4) Production Design.

COM 204 Elements of Aesthetics I

Credit Hours: 3

This is a 3 credit-hour seminar course that operates at the nexus of media theory, history and practice, and introduces students to these elements through analysis of media artifacts. Taking a nonchronological approach, the course uses topics in film history, theory and film movements, examining them within the context of a particular element in the filmmaking process. The first part of this two-part course will examine the media traditions from North-America and Europe.

COM 301 New Media & Journalism

Credit Hours: 3

This is a 4 credit-hour studio course with 1 credit-hour lab. This modular course will dive deeper into the world of non-fiction media and will provide a firm grounding in the basics of documentary and non-fiction mediamaking for TV, film, digital and New Media. It will delve into both praxis and theory. The course will go a step further and will touch upon documentary as a medium in reportage and journalism, thereby creating a foundation for students interested in journalism and non-fiction communication mediums. And, finally, the course will consider media production in the digital age,

exploring media art practice as well as emerging digital mediums, platforms and avenues. The course will consist of the following modules: 1. Introduction to Documentary Production; 2. Topics in New Media; 3. Reportage & Journalism; & 4. Media production in the digital age.

COM 302 Elements of Aesthetics II

Credit Hours: 3

This is a 3 credit-hour seminar course that carries forward the work started in Elements of Aesthetics I and introduces students to these elements through analysis of media artifacts. The second part of this two-part course will examine media traditions from the non-Western world, specifically focusing on South Asia.

COM 303 Digital Media & Post-Production

Credit Hours: 4

This is a 4 credit-hour studio course with 1 credit-hour lab. This modular course covers postproduction techniques for audio and visual media highlighting editing as an amalgamative process and an act of authorship fundamental to the storytelling process. The four modules in this course cover: 1) Graphics; 2) Animation; Sound Design; and 4) Music and Score.

COM 304 Contextualizing Media

Credit Hours: 2

This is a 2 credit-hour seminar course. This survey course examines the history of print, radio, TV, film and digital media, examining their impact on the socio-political history of Pakistan in order to contextualize and localize the history of various communication mediums and their importance and impact at the societal level.

Required Concentration Core Courses – Design

DES 201 Designing for Interactions

Credit Hours: 4

This is a 4 credit-hour studio course with 1 credit-hour lab. It will introduce students to the fundamental concepts, principles, frameworks, tools and practices of interaction and user experience (UX) design. Interaction design lies at the intersection of many different disciplines and methodologies. Therefore, it is only natural that designers learn principles that are extracted from disciplines like Industrial Design, Engineering and Communication Design. Historically, especially in Pakistan design in general has had the reputation of offering 'cosmetic' value to works of engineers, writers and now technologists. Design traditionally only comes up towards the end of the project. Although this thinking has been changing, the shift is painfully slow. Besides a shift in thinking of the business and corporate world this shift will come from designers themselves. Only designers who

see design as an integral part of everyday life, innovation, systems, technology and resulting solutions will be able to create that shift.

This course will be a glimpse of this journey for students where they see, understand and practice design that has its effects from individuals to larger groups. This understanding will come through developing an understanding of how humans interact with the world around them, their physical and mental processes and limitations.

DES 202 Design, Technology and Society

Credit Hours: 2

This is a 2 credit-hour seminar. It will introduce students to different theories and perspectives on technology important to designers from a range of fields and disciplines, including philosophy of technology, science and technology studies and material culture, to think around the nature and scope of design practice in the modern world.

As humans (designers, engineers, business managers, computer scientists, marketers) shape products, services and technologies around us; these products, services and technologies shape us in turn. Technology affects how we live, how we behave, how we interact with other humans, and even how we perceive the past, present and future. In 2021, two decades into the 21st century, living in a metropolitan city that Karachi is, we are surrounded by technology. Whether that is our smartphones, fans, refrigerators, cars, laptops, ATMs, card POS machines, there is barely an hour spent without interacting with some kind of tech. This course aims to critically analyze this relationship of *humans* with design and technology; and also of *designers* with technology. The course also tries to draw comparisons with the worldwide view of technology compared to how technology is perceived in Pakistan and the Subcontinent.

DES 203 Designing for and With People

Credit Hours: 4

This is a 4 credit-hour studio course with 1 credit-hour lab. It will build on the prior studio, pushing students to employ field research and qualitative methods to study, analyze and understand local communities, and then use their findings to generate insights and ultimately, develop product and service interventions that will aid those communities.

In this studio-based course students will develop an understanding of core concepts of Human Centered Design (HCD) and basics of Service Design through a practice-based approach. Students will immerse in a classic wicked problem, and enrich their contextual understanding through field work. They will engage in methods of research that include participatory, observational, interviews, self-reporting and generative. All research in studio will result in designing and prototyping interventions that will range from products to services.

DES 204 Research in Design

Credit Hours: 2

D This is a 2 credit-hour seminar. It will complement the studio, providing students with both historical perspectives on the development of research in the field of Design, as well as introducing them to a range of qualitative methods. Design Research is the foundation on which many facets of contemporary design practice (both professional and academic) currently stand e.g., UX & interaction design, service design, systemic design, speculative design etc. This course serves as an introduction to the vast and evolving field of design research. This includes the various types of design research, its relationship with the practice of design, its contextual importance, and the various methods and techniques used to conduct such research and synthesize the findings.

DES 301 Systemic Design

Credit Hours: 4

This is a 4 credit-hour studio course with 1 credit-hour lab. It will introduce students to core concepts, methods and techniques in analyzing, understanding and designing for complex human systems at every level of scale. They will be introduced to core concepts in systems thinking, including first and second order cybernetics, designing for conversation, wickedness and complexity, leverage points, etc. Students will deploy these methods as they seek to understand and tackle large infrastructural projects of significant complexity.

DES 302 Design and Social Change

Credit Hours: 2

This is a 2 credit-hour seminar. It will complement the studio, providing students with a range of perspectives, as well as frameworks and techniques, for transitioning societies through design, working up from the scale of the individual to large systems, while putting into context the necessity for societal transitions through engaging with critical challenges like climate change, globalization and development, and social empowerment and justice.

DES 303 Design Fictions & Provocations

Credit Hours: 4

This is a 4 credit-hour studio with a 1 credit-hour lab. It will introduce students to using design practices in the service of producing provocations around technology and social and cultural change, as well as coming up with alternatives to present paradigms and envisioning different kinds of technological futures through design fictions. Students will be introduced to some of the theory and history of speculative and critical design practice, and to design fictions and futuring, and will, through several projects, learn to design things that provoke reflection, debate, and imagine otherwise.

DES 304 Design Politics & Ethics

Credit Hours: 2

This is a 2 credit-hour seminar. It will complement the studio, giving students exposure to various discourses, frameworks and perspectives on issues of contemporary importance as they understand designed technologies as inherently political, and, therefore, necessitating ethical responsibility on the part of designers.

CND Electives

CND 223 (Re)Covering Ethnicities

Credit Hours: 3

This is a journalism course focused around covering Karachi in the backdrop of its ethnic diversity. Students will get firsthand experience of going into the field and reporting news stories and features, as well as producing photo features. Sophomores, juniors and seniors who love roughing it out on the streets of the city are most welcome. This course's workload relies heavily on fieldwork and time management.

CND 325 Writing the American Sitcom

Credit Hours: 3

The course aims to provide students with the tools necessary to pitch, develop, and write a pilot episode of an original half-hour single camera comedy. Current television pilots and series will be analyzed. The class will replicate as much as possible the atmosphere of the "writers' room" on a sitcom during production. As with a real sitcom staff, the class will offer constructive criticism of each other's work. The various roles in the writer's room will also be explored. Students will pitch an idea for a half hour single camera show and work with other writers on developing a script. At the end of the term students will submit the complete script of a sitcom pilot and a series bible.

LIT/CND 362 Art of Fiction II – Contemporary Short Stories

Credit Hours: 3

This workshop course on reading and writing short stories will investigate the genre from 1975 to the present day. We shall focus on elements of craft and examine the place these stories hold in their respective milieux, with the aim of informing and inspiring ourselves to produce our own works of short fiction. Beginning with Raymond Carver's seminal Will You Please Be Quiet, Please?, we shall adapt an urgent, international focus, reading stories from traditionally underrepresented places and communities, as well as those entrenched in the canon of contemporary British and American Literatures. We will also read and critique our peers' stories with precision and generosity, with the aim of helping each writer achieve the best possible version of her stories, and refining our own work in the process.

COM 21x Cinematography in Pakistani Cinema

Credit Hours: 3

The aim of the "Cinematography & Visual Storytelling in Pakistani Cinema" course is for students to develop a deeper understanding of how the visual storytelling of Pakistani cinema has evolved throughout different eras because of politics, culture, and technology and demonstrate this knowledge into their own films projects. Students will analyze the cinematography techniques used in different eras of Pakistani cinema by studying aspects of lighting, composition, camera movement, production design as well as politics, culture, and technology that impacted how these films were shot throughout the different eras. Students will demonstrate their deeper understanding of the visual storytelling by practicing the different cinematography techniques in different in-class exercises, video essays, and their own film projects that will help develop their own visual language as a storyteller.

COM 22x Media and Migration

Credit Hours: 3

Global migration flows have reached unprecedented levels today. About a quarter of a billion people— or 3.3 percent of global population—currently live outside their country of birth. These flows, of course, are not without controversy. This course will explore the role of the media and information technologies in shaping our understandings of migration and race. We will draw from inter-disciplinary scholarship from History, Sociology, Geography, Media and Cultural Studies and Critical Race and Ethnic studies, to inform our understandings of media, migration, and race in the contemporary historical moment.

DES 211 Essentials of Animation

Credit Hours: 3

This course is based on Hand drawn traditional Animation approach. We study the Principles of Animation with a practical approach and decode the mechanics of motion in Characters and objects. We develop a character and give it personality through actions. We will conclude our course with a personal animation presentation made through the use of different mediums and methods with particular individual styles.

DES 21x Illustrating Words

Credit Hours: 3

A large part of being an illustrator involves interpreting and visually translating existing text. This course focuses on reading and interpreting the written word. Students will explore excerpts from books, short stories, folktales, poems, lyrics, news articles and personal written pieces through visual formats like the comic poem, sequential art, zines, graphic novels, book covers, album art, editorial illustration and illustration essays. Students will also critically reflect on their role as interpreters and the responsibility that comes with it through readings, class discussions and experimental visual prompts, enhancing their decision-making and visual communication skills. This course is for avid

readers, aspiring storytellers, and visual thinkers who want to pursue illustration professionally, as well as students looking to incorporate illustration into their writing practice.

DES 21x Experimental Media

Credit Hours: 3

This course introduces students to video art, performance art, and photography pertaining to the themes of spirituality, parafiction, voyeurism, and feminism. The course will alternate between theory, studio, and critique. Under theory, we will study the history and prominent works of artists. In this vein we will look at the works of Bill Viola, Andy Warhol, Shirin Neshat, Marina Abramović, Coco Fusco, Guillermo Gómez-Peña, Janet Cardifff, Sophie Calle, and Jeff Mermelstein. The studio section of the course will introduce students to photomanipulation, video/sound recording and editing techniques with the end aim of displaying it in unconventional ways i.e. through projection mapping.

DES 339 Landscape of Imagination

Credit Hours: 4

The landscape of Imagination undertakes a historical analysis of painting practices within the south Asian context. It proposes an inquiry toward diverse modes of image production backdrop painting in relation to the handmade camera known in the Urdu language as the "Soul Catcher," poster art and other forms of paintings produced by working-class communities in South and West Asia. It will investigate the contemporary history of paintings in the city of Karachi and possibly Lahore. By reconsidering the tradition of painting, based on accounts of local painters and archival materials related to the subject of inquiry, it aims to examine the relationships they reveal between class identity, the means of production, and the imaginaries depicted in the paintings. The course investigates diverse subjects within the context of urban life in South Asia. Simultaneously, it explores the notion of transculturalism by looking at the subject and technique of traditional backdrop painting, disclosing the era's shifting relationships between global and local subjectivities of image production, colonial history and history from below. This course's overlapping fragments illustrate these shifting relationships. This course attempts to emphasize transnationalism by undertaking a multi-sited investigation, exploring possible correspondences between (and within) societies that share interconnected histories, taking into account cinema, traces of unconscious colonial memory and proletarianism, as well as their underlying technologies of image production. It is also an attempt to bring forth the micro characteristic of common practice and to establish an archive at Habib University in Karachi.

Comparative Humanities

BA (Honors) Comparative Humanities

Faculty

Muhammad Haris	Assistant Professor and Program Director
Najeeb Jan	Associate Professor
Nauman Naqvi	Associate Professor
Syed Afzal Ahmed	Associate Professor (Professor of Practice)
Nahrain Al-Mousawi	Assistant Professor
Daniyal Ahmed	Assistant Professor (Professor of Practice)
Inamullah Nadeem	Assistant Professor (Professor of Practice)
Yousuf Kerai	Senior Lecturer
Marcelo Alves de Paula Lima	Lecturer
Haniya Habib	Dean's Fellow and Lecturer
Muzammil Patel	Dean's Fellow and Lecturer
Abdullah Hussain Mirza	Dean's Fellow
Basharat Issa Khan	Dean's Fellow
Nimra Farooq	Dean's Fellow

Vision

Comparative Humanities offers students an exciting opportunity to study several disciplines in the humanities both critically and comparatively. Our areas of concentration include Philosophy, History, Literature, and Religious Studies. In teaching students to move fluidly across disciplines, we aim to cultivate not only breadth and depth, but an intellectual mindset attuned to the shared problems we face today as global citizens. CH will challenge students to reflect on a range of theories about human nature and society — drawing from diverse cultures, histories, and traditions — and

in doing so heighten their sensitivity to the way our rapidly globalizing age of transnational capital has reshaped our understanding of concepts such as self, identity, obligation, community, and nation.

Students who pursue a CH major will learn to think both locally and globally, will learn to examine problems through a number of intellectual frameworks and traditions, and practice honing the skills of humanistic inquiry that continue to make the comparative humanities essential to the dynamic and multidimensional job markets of tomorrow. Learning to think comparatively within the humanities means learning to think flexibly and differently about the many problems we encounter in various professional domains.

It also means knowing how to use a critical framework to think through a difficult problem and, more crucially, knowing how to articulate and assess that problem in language that is at once cogent and graceful. A CH degree, therefore, clearly has both direct and indirect relevance to future pursuits in academia, media, journalism, management, government, law, and medicine, among the many other civic and international sectors in leadership where an insightful, perceptive, agile mind is an obvious mark of distinction.

Program Learning Outcomes

Students who graduate with a degree in Comparative Humanities will be able to:

1. Work comparatively and critically across several disciplines and traditions.
2. Discuss the genealogy and development of major figures, periods and ideas in the disciplines of Philosophy, Literature, Religion, History and Music.
3. Synthesize multiple points of view in working with a series of thematically related texts, traditions, or disciplinary perspectives.
4. Apply a range of ethical, critical and theoretical frameworks to contemporary intellectual concerns.
5. Produce a theoretically informed close reading of a central work in dialogue with several other works and traditions.
6. Navigate databases and assess primary and secondary materials.

Requirements for the Major – Class of 2026

All students majoring in **Comparative Humanities (CH)** program are required to complete a total of minimum **37** courses **(124 credit hour)** requirements. The courses are divided in the following categories:

University Requirements

All students are required to take **ten** courses spanning seven forms of thought and action, called the Habib Liberal Core. Some courses in the major can also be counted towards meeting requirement of certain forms of thought in the core. For more details, please see the section on Habib Liberal Core in the catalog.

Comparative Humanities Program Core

The Comparative Humanities Core curriculum consists of **five** courses in a broadening and deepening sequence, and **two** other required courses that highlight the practical implications of an education in the humanities.

Primary and Secondary Concentrations

All CH majors will be required to have one primary concentration and one secondary concentration. The concentrations are designed to cultivate depth of knowledge, command of methodology, grasp of theory and analytical skills within specific disciplines within the humanities. The primary concentration will require **six** courses and the secondary concentration will require **four** courses. The four areas of concentration include:

Primary Concentrations			
History	Literature	Philosophy	Religious Studies

Capstone Project and Final Thesis

All CH majors will be required to complete a capstone project. In most cases this will involve a significant revision of one of their best research papers. The final thesis is an alternative capstone option and is not a requirement for all students in the program.

Requirements for the Comparative Humanities Major (Class of 2026)

Course Category	Courses	Min. Courses	Min. Credit Hours
University Requirements	Habib Liberal Core*	10*	35*
Comparative Humanities Core Sequence (07 courses)	HUM 101 Critical Inquiry and the Humanities	01	04
	HUM 200 World Historical Figures: Statesmen, Leaders, Judgement	01	04
	HUM 201 Conceptual Genealogies	01	04
	HUM 300 Criticism, Dissent and the Ethics of Disagreement	01	04
	HUM 301 Comparative Hermeneutics I (Major Works and Traditions Seminar)	01	04
	HUM 401 Comparative Hermeneutics II (A Major Work in Context Seminar)	01	04
	HUM 402 Capstone Research Seminar	01	04

Course Category	Courses	Min. Courses	Min. Credit Hours
Primary Concentration in one of the four areas: Philosophy, Literature, History and Religious Studies (06 courses)	**Primary Concentration in Philosophy**		
	PHIL 200: What is Philosophy? or PHIL 122: Introduction to Western Philosophy	01	03
	PHIL Elective Any Level	03	09
	PHIL 3xx / 4xx Level Elective	02	06
	Primary Concentration in Literature		
	LIT 104 What is World Literature?	01	03
	LIT 225: Introduction to Literary Theory and Criticism	01	03
	LIT Elective Any Level	02	06
	LIT 3xx / 4xx Level Elective	02	06
	Primary Concentration in History		
	HIST 1xx/2xx Global Histories	01	03
	HIST 227 Understanding Histories: Historiography and Historical Methods	01	03
	HIST Elective Any Level	02	06
	HIST 3xx / 4xx Level Elective	02	06
	Primary Concentration in Religious Studies		
	RELS 122 An Introduction to World Religions	01	03
	RELS 223 Comparative approaches, methods and key issues in the study of religion	01	03
	RELS Elective Any Level	02	06
	RELS 3xx / 4xx Level Elective	02	06
Secondary Concentration in one of the four areas: Philosophy, Literature, History and Religious Studies (04 courses)	**Secondary Concentration in Philosophy**		
	PHIL 200: What is Philosophy? or PHIL 122: Introduction to Western Philosophy	01	03
	PHIL Elective Any Level	02	06
	PHIL 3xx / 4xx Level Elective	01	03

Course Category	Courses	Min. Courses	Min. Credit Hours
	Secondary Concentration in Literature		
	LIT 104 What is World Literature?	01	03
	LIT 225: Introduction to Literary Theory and Criticism	01	03
	LIT Elective Any Level	01	03
	LIT 3xx / 4xx Level Elective	01	03
	Secondary Concentration in History		
	HIST 1xx/2xx Global Histories	01	03
	HIST 227 Understanding Histories: Historiography and Historical Methods	01	03
	HIST Elective Any Level	01	03
	HIST 3xx / 4xx Level Elective	01	03
	Secondary Concentration in Religious Studies		
	RELS 122 An Introduction to World Religions	01	03
	RELS 223 Comparative approaches, methods and key issues in the study of religion	01	03
	RELS Elective Any Level	01	03
	RELS 3xx / 4xx Level Elective	01	03
Other Requirements	Comparative Humanities Electives - Any level HIST, LIT, PHIL, RELS elective	02	06
	University Wide Free Electives	07	21
	Independent Study (Thesis) **OR** Any Free Elective (if not taking Thesis)	01	03
	Overall	**37**	**124***

- Electives (program/free) need to be taken so that overall total credit hours are 124.
- Note 1 - Students can double count free electives in the grid towards completion of requirements for declared concentrations in HIST, LIT, PHIL, or RELS. This is applicable only for students pursuing beyond the minimally required one primary and one secondary concentration.
- Note 2 - Regarding "Free Electives", students have the option to take 1 and 2 credit hour courses, with the understanding that they will have to complete the total of 124 credit hours coursework (and a minimum of 37 courses) minimally required for graduation. The "Free Electives" descriptor refers to a category of course, rather than a specific course.

Minors Offered by the Comparative Humanities Program

S. No	Minors	Offered by	Offering School	No. of Courses	No. of Credit Hours
1	Comparative Literature	Comparative Humanities (CH)	SAHSS	06	18
2	Philosophy			05	15
3	Religious Studies			05	15
4	History			05	15
5	South Asian Music	South Asian Music Center & CH Program		05	15
No single Habib Liberal Core course can count towards fulfilling requirements towards completion of more than one of CL, HIST, RELS, and PHIL Minors.					

Requirements for each minor can be found in the 'Minors' section of the Course Catalog.

Course Descriptions

Required Comparative Humanities Core Courses

HUM 101 Critical Inquiry and the Humanities: Love and Desire

Credit Hours: 4
Prerequisites: None
Fulfills: Comparative Humanities Program Core

This is the First-Year team-taught introduction to both the four humanities disciplines taught at Habib University (History, Literature, Philosophy and Religious Studies) and an introduction to interdisciplinary conversation and approaches in the humanities. Students will learn the methods, aims and styles of inquiry practiced by our faculty. To provide an example that will hopefully clarify this approach, in the fall of 2020 we piloted this course using "love and desire" as the central organizing theme.

This course was team-taught and consisted of four units, one for each of the four major concentration areas (PHIL, LIT, RELS, HIST) in the program. Using the central organizing theme of love and desire, students explored how each of these four disciplines frames and examines some aspect of this broad complex issue that transcends a single academic discipline. In this case students considered what sorts of questions historians, scholars of literature, philosophers and religious studies scholars ask about a broad but complex topic like love and desire, and how they analyze the topic and pursue answers to the questions they ask. By bringing these four disciplinary fields in the humanities into

conversation, students learned both about how each discipline works and also about how intellectual discourse across disciplinary boundaries proceeds. This facility for interdisciplinary inquiry is an important outcome for this major, and it yields the distinctive abilities in critical thinking for which the graduates of humanities programs have long been distinguished and valued. Through this introductory core course in Comparative Humanities, we also hope that our students will develop deeper appreciation for differing perspectives.

HUM 201: Conceptual Genealogies Master Slave Dialectics

Credit Hours: 4
Prerequisites: None
Fulfills: Comparative Humanities Program Core

This second course in the CH core sequence involves engagement with the historical and cultural formations of modernity across world traditions. Students will learn to think comparatively about cultures and traditions using the methods, aims and styles of inquiry practiced by our CH faculty. In Spring 2022, this course had been subtitled: "Master Slave Dialectics"

The course begins with a five-week literature module, followed by a five-week philosophy module, and finally a five-week history module. Starting with fiction and storytelling, students become affectively involved with the genealogy and interpretative hermeneutics of the master-slave dialectic. This structure creates an affect-concept-event rhythm, which the students can then carry into their comprehensive final project for the course. Following on HUM 101, which for the year was themed on love and desire, HUM 201 shifts attention to power and desire, and specifically the master and slave theme. The first unit in the course will treat more or less metaphorical examples of the master-slave dialectic. In Shakespeare's The Tempest we will be examining the power structure inherent in Father/Son and Father/Daughter relations, as well as the relation between the colonizer and the colonized. In Ralph Ellison's Invisible Man, we will consider racial relations in 1950s America, the power dynamic between Americans of European descent and Americans of African descent, and the power of education to engender equality. Throughout this module students will be asked to make connections between the texts and concepts treated and their own lived experience, as well as those around them.

The second module of this course creates focus on the master and slave dialectic as engaged in several influential philosophical texts including: (1) Nietzsche's On the Genealogy of Morality, "First Essay: Good and Evil, Good and Bad;" (2) Hegel's Phenomenology of Spirit, "Independence and Dependence of Self- Consciousness: The Dialectic of Lord and Bondsman;" (3) Marx's "Critique of the Hegelian Dialectic and Philosophy as a Whole" from his Economic & Philosophical Manuscripts of 1844; Marx's "Fragment on

Machines" from his Grundrisse; (4) Judith Butler's Desire, Rhetoric, and Recognition in Hegel's Phenomenology of Spirit; (5) Gadamer's Hegel's Dialectic of Self-Consciousness; and (6) Habermas', Labor and Interaction. There are three main objectives of the philosophy module. First, to introduce conceptual genealogy as a mode of investigation in philosophy by showing how different philosophers explored the master-slave theme in their respective philosophical projects, thereby reorganizing existing thought and generating new thought on the theme. The second objective in this module is to engage the readings in the philosophy unit to consider how the genealogy of the master-

slave theme gives us perspective and insight into the origins and subsequent development of two different kinds of philosophical hermeneutics, a hermeneutics of suspicion and a hermeneutics of affirmation and openness. Further, we consider the dialectical tension between these two kinds of hermeneutics in the writings of Nietzsche, Hegel, Marx, Butler, Gadamer, and Habermas. Our third objective is to think about how the Nietzschean-Hegelian-Marxian perspective on the genealogy and hermeneutics of the master-slave theme might help us gain insight into intersectionality and contemporary struggles and insecurities around the politics of class, race, identity, multiculturalism, gender and sexuality. This last objective will also motivate discussion on relevant struggles within the field of philosophy, as seen in the appropriation and interpretation of the master-slave theme in contemporary poststructuralist and postmodern philosophy.

The final module of this course will provide a historical view of the master slave dialectic. Firstly, we will be discussing the history of slavery in the ancient world, especially in Greek and Roman societies. The ethnic diversity of slavery in the Classical world, slave uprisings, and the decline of slavery in the late-Ancient Age are all relevant issues. The module will then proceed to analyze the main aspects of slavery in the modern world and the main differences and similarities between ancient and modern slavery. Special emphasis will be placed on the role of slavery in North America during European colonization. The module will then tackle the religious and moral dilemmas faced by Spanish and Portuguese colonizers regarding the enslavement of native Americans, their decision to enslave Africans and how slaves resisted. Readings will include Dale Tomich's Through the Prism of Slavery: Labor, Capital, and World Economy; Ira Berlin's Many Thousands Gone: The First Two Centuries of Slavery in North America; Boris Fausto's A Concise History of Brazil, Gilberto Freyre's the Masters and the Slaves, as well as several articles.

HUM 200: World Historical Figures: Leadership, Judgment, and Authority

Credit Hours: 4
Prerequisites: None
Fulfills: Comparative Humanities Program Core

This CH core course explores leadership and the mechanisms of authority and power in world history. In Spring 2022 this course has been subtitled: Toussaint Louverture and Simón Bolívar.

Simón Bolívar (1783-1830) and Toussaint Louverture (1743-1803) were two key leaders of the independence movements that spread across Latin America in the early 19th century. While Bolívar led the patriotic armies that defeated Spanish colonialism in South America and contributed to the liberation of Venezuela, Colombia, Peru, and Bolivia, Toussaint was one of the leaders of the slave uprising that culminated with the Haitian independence from French colonial rule. The purpose of this course is to delve into these two mythical figures for the History of the modern world in order to understand their political projects, their ambitions, their triumphs, and their disappointments. 200 years after the proclamation of independences in Latin America, a reasonable understanding of how these independence movements unfolded is of utmost importance to critically analyze the current situation of those countries.

Instead of approaching these two leaders as isolated figures, we will strive to understand the cultural, social, and political contexts in which they were inserted and how both helped shaping those contexts. The notions of leadership, judgment, and authority will be our guiding principles. Rather

than the incontestable leaders that a more romantic narrative could portray, both faced challenges to their authorities and had to negotiate with other historical actors who had divergent projects. Hence, our readings will also shed some light on the challenges posed to the authority of those leaders and on how they strived to overcome them. Moreover, we will also focus on how these two figures have been judged by different narratives in the Haitian and South American societies in the past decades. To which extent is Toussaint considered a hero in today's Haiti? How has Hugo Chávez, in Venezuela, appropriated and idealized Simón Bolívar to legitimize his "socialism of the 21st century"?

The course is divided in four modules. The first module tackles the Haitian Revolution, the second independence in the American continent and the only one to be proclaimed by slaves. The second module delves into the figure of Toussaint Louverture, one of the distinguished leaders of the Haitian Revolution. The third module covers the independence process in South America by highlighting its antecedents, its challenges, and its outcomes. Lastly, the fourth and final module analyses the role played by Simón Bolívar in this process, as well as the clashes with other leaders.

HUM 300: Criticism, Dissent and the Ethics of Disagreement

Credit Hours: 4
Prerequisites: None
Fulfills: Comparative Humanities Program Core

This will be a 300-level course on social responsibility and the ethics of disagreement. In this course we will engage students in complex and contentious arguments in the humanities through the works of prominent public intellectuals with the goal of enhancing their capacities to participate forcefully, effectively and respectfully in civil discourse.

HUM 301 Comparative Hermeneutics I: Major Works and Traditions Seminar

Credit Hours: 4
Prerequisites: None
Fulfills: Comparative Humanities Program Core

This third-year seminar will continue work with major thinkers and traditions in dialogue, but take students deeper into more localized tensions within the field. The goal will be to examine an academic debate or problem of some sophistication within the discipline, or between several disciplines. Students will work with one or two key figures to help deepen their understanding of that debate, or attempt to initiate their own related line of inquiry based on close work with one or two central figures

HUM 401: Comparative Hermeneutics II: Major Works and Traditions Seminar

Credit Hours: 4
Prerequisites: None
Fulfills: CH Core

This course will serve as a senior seminar, ideally as a preliminary study or as a complement to the capstone research seminar (HUM 402), which will challenge students to define a compelling

problem, project, or line of inquiry that requires extended critical analysis and work with several texts, traditions, or disciplines in conversation.

Examples of these Senior-level deepening seminars may include in-depth studies of Marx, Agamben, Poststructuralism, Gadamer, Feminism, the Anthropocene, Postcolonial theory, James Joyce, environmentalism, Sufism, etc., depending on faculty interest and availability. Students will be expected to focus on a central thinker, key work, major period, influential religious movement, school or doctrine for close examination

HUM 402: Capstone Research Seminar

Credit Hours: 4
Prerequisites: None
Fulfills: CH Core

The final course of the deepening sequence in the CH core sequence will be a workshop course for the Seniors working on their capstone projects or senior thesis.

Required Philosophy Concentration Courses

PHIL 122 Introduction to Western Philosophy

Credit Hours: 3

This course aims to provide a systematic introduction to the main problems of metaphysics, epistemology, ethics and aesthetics, as addressed in the Western philosophical tradition. It familiarizes students with central debates in Western philosophy and permits them an overview of the works of some of the discipline's most pertinent thinkers. It does so by pointing out long term traditions of Western philosophical thought as well as their implications for contemporary intellectual discourse. It engages with several important issues concerning the nature of knowledge, truth, self, reality, consciousness, morality, language, and God. Along with reading texts by classic figures such as Plato, Descartes, Hume, and Kant, students will also get to study modern and contemporary thinkers such as Simone de Beauvoir, Ludwig Wittgenstein, Edmund Husserl, Hannah Arendt, Martha Nussbaum, and Derrida. Students will learn to engage with various philosophical issues critically, to compare them analytically, and to translate what they mean for the present. In so doing, students will acquire the critical analytical vocabulary to understand our current socio-political predicament in a reflected and philosophically-informed way.

PHIL 200 What is Philosophy?

Credit Hours: 4

Taking a comparative approach to the subject matter, this course investigates the original writings of a range of contemporary philosophers, where they have problematized and responded to the "what is philosophy?" question. The writings under consideration help us grapple with differing frameworks and conceptual lenses for generating clarity on the fundamental question of philosophy, and the process, work, purpose, and history of philosophy. This course calls for consistent focus on

careful reading, writing, research, presentation assignments, and intensive class participation commitment. The philosophers whose writings we consider this semester include: Noam Chomsky, Michel Foucault, Martha Nussbaum, Alain Badiou, Louis Althusser, Gilles Deleuze, Félix Guattari, Reza Negarestani, Jean Francois Lyotard, Jacques Derrida, Anne Dufourmantelle, and, Jaun Elia.

Required Literature Concentration Courses

LIT 104 What is World Literature? Introduction to the Study of World Literatures

Credit Hours: 3

This course is an introduction to literary study that develops students' critical reading skills through the analysis of poetry, prose, drama, and/or film. Themes of the course will focus on the ways different individuals, societies, and cultures represent themselves in literature, and how we read and interpret those forms of representation through the application of basic critical literary tools and theories.

LIT 225 Introduction to Literary Theory and Criticism

Credit Hours: 3

This course explores the major theories of reading and interpreting literature that developed throughout the twentieth century. Literary Theory and Criticism attempts to answer a range of questions central to the nature of literary experience. It examines the production of value and meaning in works of art, grapples with the mediating power of history and culture in framing how we understand those works, and highlights the role of tropes and formal elements like imagery, metaphor, symbol, genre, and narrative in shaping how we experience texts aesthetically. Literary theory also explores questions of authorship and intertextuality, gender and agency, and language and representation. In reflecting on these questions, students will engage critically with some of the most influential theorists, schools of thought, and conceptual problems that have come to define literary studies in the past century, ranging from practical criticism to semiotics to post structuralism. As a final project, students will undertake a theoretically informed reading of a text of their choice.

Required History Concentration Courses

HIST/SDP 190 (Global Histories) Military Regimes in South Asia and South America

In line with Habib's emphasis on the postcolonial world and on a global approach of History, the purpose of this course is to analyze and understand the history of military regimes in South Asia and South America.

Though not ignoring the role of local factors, the main concern of this course will be to encourage students to identify a common background that led to the emergence of military regimes in both regions. The Cold War bipolarity, U.S. efforts to prevent the dissemination of left-wing regimes in the periphery, and a widespread anticommunist imaginary that transcended borders are all significant

parts of this common background that will be contemplated by the readings and class discussions. Hence, rather than seeing these military regimes as sole products of local or regional politics, this course encourages us to think them as parts of a broader international picture of the Cold War in which the Third World was a stage of clashes between the United States and the Soviet Union.

The course will begin with readings on how the Cold War unfolded in South Asia and South America, as well as the role played by these regions in North American foreign policy. The second module encompasses military regimes in Pakistan. We will understand the circumstances that triggered the military coups of 1958 and 1977, as well as the main aspects of these regimes. The third and last module approaches the History of military regimes in Argentina, Brazil, and Chile, highlighting their differences and similarities. As we discuss the main aspects of South American military regimes, we will also strive to find differences and similarities between them and the Pakistani military regimes.

Readings and discussions will be guided by relevant questions, such as: what was the U.S. role in these military coups? To which extent the governments they brought to power were part of the Cold War clashes? How did these governments portray the East-West cleavage? Despite U.S. intervention, were there also tensions between Washington and these military regimes?

HIST 227 Understanding Histories: Historiography and Historical Methods

The aim of this course is to develop the historiographical and analytical skills necessary for students to conduct advanced research in the historical field. It is intended for history majors and minors to make the jump from learning specific histories to thinking more broadly about studying the past. It introduces students to trends in modern historiography, which, while meaning the literal writing of history, is also used to refer to theories of history and the history of "history" as an academic field.

Sampling a range of texts, we will explore some fundamental components of historical thinking, including ideas about context and causation, methods of historical analysis, issues of truth and objectivity and conflicting interpretations within historical approaches and genres. Through intensive reading, discussions and written essays, we will look into the methods and rich varieties of historical inquiry, the dynamic nature of scholarship and some of the recent shifts in the discipline.

The course asks students to think about a range of questions related to the discipline: What is history? How have historians approached the study of the past? How and why have there been changes in approaches to the study of history?

Required Religious Studies Concentration Courses

RELS 122 An Introduction to World Religions

Credit Hours: 3

This is the required foundational course for both the primary and secondary concentrations in Religious Studies for majors in the Comparative Humanities (CH) program. It is also the required gateway course for students in any other major at Habib who wish to complete a minor in Religious Studies. Finally, this course may also be taken as a lower-level elective by any student who is simply curious to learn something about the major world religions.

The course is designed to fulfill two critical objectives. The first objective is to develop a sound introductory level understanding of five great world religions (Buddhism, Christianity, Hinduism, Islam and Judaism). Collectively, these five religions account for 6.1 billion of the world's 7.79 billion people. Of the 1.69 billion people not covered by these five major world religions, 1.19 billion people are classified as "secular," "nonreligious" or "agnostic/atheist." It's important to emphasize the word "introduction" in the title of this course. It would be easy to spend a lifetime studying each of these religions, so no one course can do more than scratch the surface. It's also important to stress that no religion can be distilled down to some essential core, and one of the recurring themes of this course will be the tension between unifying aspects of the tradition and the tremendous diversity that exists within all religions. Similarly, religions don't exist in the abstract, they exist in the context of specific times and cultures, which both shape and are shaped by religion.

A second objective of this course is that it is also designed to introduce you to the scholarly humanistic study of religion. What does this mean? First, let's consider what the humanities are. They are an interrelated series of academic disciplines that explore what it means and has meant to be human across both time and geographical space. And, as we'll discuss in greater detail in a moment, from our earliest historical records of abstract human thought, religion seems to have been universally central to human expressions of meaning.

RELS 223: Comparative Approaches, Methods and Key Issues in the Study of Religion

Credit Hours: 3

The study of religion arguably represents one of the most stimulating field of research today in the humanities and social sciences. But what is "religion" and how are we to approach it academically? Totally in sync with the overall vision of the CH program, this course will evolve as a comparative and transdisciplinary approach to religious studies. This course will expose students to fundamental theoretical and methodological issues in the academic study of religion. It will also explore ways or lenses through which the study of religion could be approached by introducing students to classic works and authors (Durkheim, Weber, Freud, Marx, James, etc.), and also examining their legacy and continuing influence upon the field of religious studies. In addition to familiarizing students with a variety of approaches to understanding religion (as a social phenomenon, an "experience," and a body of lived practices), the course gives attention to the construction of the category of "religion," ethical issues involved in the study of religion, and issues and topics (gender, secularism, pluralism, postcolonialism)

Elective Courses

HIST 332: History of Brazilian Independence

Credit Hours: 3
Fulfils: Global Histories Requirement

September 2022 marks the bicentennial of the Brazilian Independence. Although the Brazilian process of emancipation from Portugal happened simultaneously with the Spanish American independences, events in Brazil unfolded differently due to the presence of the Portuguese Royal

Family in the colony since 1808. In a rather ironic turn of events, the Brazilian independence was proclaimed by a member of the same royal family who ruled the country during the colonial period. Unlike its neighbors, Brazil also managed to preserve its territorial integrity, besides becoming independent as a monarchy, and not a republic.

In line with Habib`s global approach to history, the purpose of this course is to analyze and understand the Brazilian independence from Portugal in 1822 as a key episode in the crisis of the Iberian (i.e., Spanish and Portuguese) colonial empires. Throughout the readings and lectures, students will understand how political events at a global level paved the way to the Brazilian emancipation. Among such events, special emphasis will be placed on the Napoleonic expansion in the early 19th century, the crisis of Portuguese colonialism, the expansion of the Enlightenment ideas across the colonial world, the rise of British imperialism and its search for consumer markets.

LIT 310: Urdu and Global Voices: Translations of Modern Fiction and Poetry

Credit Hours: 3

Colonialism initiated India's encounter with the Western world and its literatures. The history of Urdu Literature includes moments when masterpieces of fiction and poetry produced in various languages were incorporated into Urdu through extensive translations sometimes from the original languages but most often through English translations. Indisputably these translations influenced Urdu Language and Literature immensely and transformed the sensibility and perspectives of both creative writers and their critics. Any study of Urdu Literature has to trace the history of these translations into Urdu to determine the sources of different literary movements and the development of various genres. This course draws upon the intellectual bond between the creative geniuses of the world and offers a better understanding of Urdu Literature by placing it in a global context while tracing its onward journey into the postmodern and postcolonial global ethics and aesthetics.

LIT 313: Postcolonial Literature of Migration and Exile

Credit Hours: 3

This course will explore postcolonial narratives of migration and the themes that emerge from them: journeys abroad, meanings of exile, transnational identities, and return to the homeland. Migrant narratives often center around what we call the "contact zone": what happens when cultures with different norms come into contact with each other through migration and sometimes colonization? Insofar as the texts reflect the various borders the authors crossed in bringing them to life—as they come from various parts of the Middle East and Africa via the US and UK—they capture the traveling identities that we will explore. Other themes that will emerge in relation to postcolonial migration narratives will include nostalgia, traditionalism, modernity, and cosmopolitanism.

MUS 101 Music of South Asia: Style & Structures

Credit Hours: 3

This course will introduce students to the rudiments of South Asian music; its melodic and rhythmic bases and the various existing styles of performance. From understanding structural differences

between genres such as folk, ghazal, thumri and khayal to recognizing stylistic differences between practitioner groups, this course will be an immersion into a musical realm that is largely unfamiliar to young listeners. With a mandatory practice component through the Khawaja Mashooqullah Music Room, audio-visual resources, and readings to provide context, the course will serve as a foundation for pursuing more advanced studies in music.

MUS 111 Breathing Bansuri

Credit Hours: 4

Every known human culture has created a flute, and the Bansuri is the primary flute of South Asia. Bans means Bamboo and Sur connotes melody. Made by burning holes in a hollow bamboo, it is one of the simplest instruments in the world, yet capable of producing the most complex sonic nuances and ornamentations. This melodic bamboo has moved us with its sounds and stories at least since 200 BC; which is when it is first mentioned in the Nātya Śāstra, an ancient Sanskrit treatise on the performing arts. Widely known as the divine instrument of Lord Krishna, it is found all over South Asia and has existed in its unchanged form for at least 2000 years, most likely more. Originally considered as a 'folk' instrument, the Bansuri was reborn in the 20th century through the experimental innovations of the great Pt. Pannalal Gosh, who created a larger sized flute and made it possible to render the complex ornamentations that are central to Hindustani Shastriya Sangeet, or South Asian 'classical' music. Through the efforts and explorations of contemporary artists such as Pt. Hariprasad Chaurasia and various others, the Bansuri is now known, loved, and appreciated all over the world with a rapidly growing interest in its learning. In the Pakistani context too, it is respected and adored in every corner of the country; yet opportunities to learn, or even acquire the instrument have become extremely rare in recent times. The Bansuri scarcely needs us to continue its enduring legacy, but neglecting it would be our own misfortune.

This course offers students the opportunity to embark on what will hopefully be a lifelong relationship with the instrument and its music. Breathing in to the Bansuri, is a portal to numerous new worlds, within and without.

MUS 222 Sound and Subjectivity: Listening to the Other

Credit Hours: 4

Every known human culture and community has produced music or exhibited sonic practices that can be classified as 'music'. Music is immensely meaningful and moving for the communities that it belongs to. However, the experience of listening to sound and music from cultures and contexts that are unfamiliar to us, can be both blissful and elating, as well as bizarre and alienating. The affect produced by strange sounds and foreign musical structures is determined by the subjectivities that constitute our own ways of listening. What then, is the nature of listening? How should we listen to, engage with, and understand music from other cultures, contexts, and traditions? How have disciplines like anthropology, musicology, and ethnomusicology historically addressed and understood nonwestern music? What are the variety of meanings- social, cultural, religious, and political- that music continues to be imbued with? What does our experience of listening to the Other tell us about ourselves? These questions form the core basis of inquiry in this course. This is a survey

course of selected musical cultures and traditions of the world that is organized through an aural geography that takes the subjectivity of our listening as its point of departure.

MUS 226 Thumri ki Kahani: Romance in Raag Form

Credit Hours:

Thumri is one of the popular styles of singing in South Asia. It is described as a dance song in the 17th Century treatises like Raag Darpan and Tohfat-ul-Hind. With the passage of time, the dance element faded and now it is mostly presented by way of vocalization. Thumri was patronized by Nawab Wajid Ali Shah, the King of Lucknow who ruled the state of Avadh from 1847 to 1856. Technically speaking, this genre is a pleasant blend of our classical and semi-classical music. Unlike the classical forms of Dhrupad and Khayal, the Thumris are glorified with short amatory texts, mostly found in Brij Basha and its allied dialects like Avadhi, Bhojpuri etc. It has gained popularity due to excessive use of singing techniques like Khataka, Murki and Bol Bant. Here importance is given to eloquence rather than purity of a Raag. That is why Thumri is also known for its variations and experimentation with the structure of Raags. These days a Thumri is usually performed as a last item of the Khayal concert. Since not many Thumri singers are alive today, it is feared that this genre may become scarce soon. Before Thumri becomes completely non-existent, we need to make an endeavor for its revival by educating the present generation.

This course will develop a student into a good listener and performer (if having vocal ability) in accordance with his/her own capacity and aspiration. It will introduce students to the Thumri genre, tracing its foundational concepts and development into a refined form of singing. Using contemporary musical framework of Thumri singing, students will be familiarized with the architecture of Thumri performance, including its evolution, lyrical themes, flexible melodic structure, rhythmic pattern and the art of Bol Bant (lyrical allocation according to rhythmic cycles). We will remain engaged with various stylistic lineages of some of the stalwarts by decoding the musical language and understanding their unique characteristic styles. A comparative study of different aesthetic ideals and genres within and around the Thumri, such as Dadra and Ghazal, will orient students in their exploration of true expressions, and improvisation in Thumri singing. By the end of the course, students will not only be able to appreciate a wide range of Thumris sung in Raags such as Pahadi, Khamaj, Des, Piloo, Bhairvi and Sohni but also to create an impressive repertoire of their own.

PHIL/COM 219 Tragic Philosophy and Film

Credit Hours: 3

Since the ancient Greeks, the philosophical relevance of tragedy as a dramatic form has always been readily recognized. Tragedy is about the limits of man: only by acknowledging these limits, man can find his place in society and in the world. In the Anthropocene, the evidence of the limits of human agency and the trouble with human hybris (i.e. the insolent transgression of those limits) is inescapable; for this and many other reasons, tragedy has still a lot to say to 21st century humanity. This course investigates the idea of the tragic, as it appears in the dramatic form known as "tragedy", in the writings of philosophers, and as a fundamental feature of human experience. Particular attention will be given to political economy, a field variously interrelated with tragedy.

Cinema will play a major role in this course, catering to CND/COM as much as CH, and conceived as an occasion of dialogue and intersection between the two programs' agendas. A selection of eight films, chosen among the very many cinematic iterations of tragedy as a dramatic form, will be discussed in-depth during the course. They will, however, be something more than mere illustrations of the tragic as a dramatic form. They will show how the classical tropes of tragedy can still speak to a number of concerns of our contemporary world: the boundaries of freedom, the inseparability between civilization and violence, the clash between individuality and institutions, the difficult possibility for a truly ethical act, and so forth.

PHIL 221 Medieval Islamic Philosophy

Credit Hours: 3

This course takes a historical, textual and analytical approach to examine problems related to ethics, metaphysics, human nature, psychology and the philosophy of religion discussed by both, the Medieval Islamic philosophers and the Kalam theologians. It will begin by providing an overview of the history of both traditions i.e. Kalam theology and philosophy, and expose students to their system of thought. Students will be offered with an in-depth study of complex debates on topics such as existence, ontology, epistemology, proof of Creation, Eschatology, Providence and Prophecy. It will also provide students the opportunity to explore both the doctrines and the contrasting intellectual systems and methods of enquiry of both traditions. Attention will be given to some contemporary scholarly debates, and the methodologies that inform them, surrounding the interpretation of certain aspects of medieval Islamic thought. The broad purpose of the course is to make students aware that while the compatibility of reason and religion may still be a topic of debate amongst contemporary intellectuals, the rich intellectual traditions of Islam valued rational faculty and logic to a greater extent in understanding the creation, the creator and their relationship. By exposing students to some primary texts, students will also become familiar with the style and language of the medieval works of philosophy and Kalam and would learn the skill of decoding the language of primary texts.

MATH/PHIL 222 Paradox and Infinity

Credit Hours: 3

The notion of a 'paradox' has been central to the development of human knowledge. Through much of the history of philosophy, there have been certain major paradoxes that have drawn the attention of some of the greatest minds in each era. Sometimes these paradoxes may seem extremely simple and trivial. So trivial, in fact, that someone may think that they are some sort of parlor trick. The temptation to treat them as nothing more substantial than verbal legerdemain can be strong. And yet, generation after generation, era after era, they continue to persist. To take a simple example, try this:

- The sentence right below this one is false.
- The sentence right above this one is true.

This seemingly simple paradox (a version of the so called 'liar' paradox) has been at the core of some of the most far-reaching developments in philosophy and science. Various attempted resolutions to it have led in surprising and unexpected directions.

In this course we will familiarize ourselves with some of the most famous paradoxes in history and look at some of the attempted solutions. It is not our purpose to endorse any solution—since many current thinkers still regard them open and unsolved problems. Instead, our intention is to gain a deeper acquaintance with some of these famous puzzles and how people have tried to overcome them.

PHIL/SDP 222 What is Power? Foucault, Biopolitics & Critical Thinking

Credit Hours: 3

This seminar serves as a concerted investigation into the question of power by way of an introduction to the thought of one of the most influential interdisciplinary social theorists of the 20th century, Michel Foucault (1926–1984). What is power and what dominant forms has power taken in the modern world? To answer such questions, seminar participants will explore Foucault's various grammars of power: sovereignty, biopolitics, governmentality and neoliberalism, and examine in particular the relationship between knowledge, power and subjectivity. Given that the concept of power is absolutely central to any understanding of society and the human condition, the course also serves as a useful introduction to core concepts in the humanities and social sciences. As such a concomitant but key emphasis of this seminar will also be on the question of what it means to think critically. This question has two components: what does it mean to think (what is thinking?) and secondly, what is critical? Given that the word critique is etymologically linked to the word crisis, we may reformulate our semester's investigations as a concern for understanding the nature of the global crisis of the present.

We will also study some of the core philosophical influences on Foucault's work: namely Frederick Nietzsche and Martin Heidegger. And lastly, we will make a brief foray into the difficult and utterly novel thought of Italian theorist Giorgio Agamben, who continues to develop Foucault's conceptual apparatus.

PHIL 326: Philosophical Hermeneutics

Credit Hours: 3

This course familiarizes students with the basic elements of philosophical hermeneutics. Specifically, it introduces students to how the categories of "text", "interpretation", and "understanding" are employed in the study of liberal arts in the contemporary academy. Through a selection of readings, it provides a historical overview of the development of philosophical hermeneutics which is indispensable for the understanding of contemporary philosophy. The scope of hermeneutics is "universal" because all acts of human understanding presume a hermeneutic dimension. As an academic subject, hermeneutics recovers and discloses other ways of understanding and experiencing truth (such as the truths of art, religion, and history), which the Enlightenment in essence rejected through its emphasis on method. Questions such as what does it mean to read a text; what are the relationships between readers and their worlds; what is a dialogue; what is the relationship between knowledge and interpretation; what is Gadamer's rehabilitation of tradition and authority (contra Enlightenment reductive views) will be taken up in this course. It also highlights the significance of concepts such as pre-judgment or prejudice (praejudicium), fusion of horizons, hermeneutical experience, hermeneutical openness, and the need for dialogical

engagement for genuine hermeneutic experience to occur. This course also introduces two most important disputes within the tradition of hermeneutics, namely "Gadamer-Derrida" and "Gadamer-Habermas" debates. Both debates help us to understand the limits of philosophical hermeneutics and the need to engage in dialogue with "Deconstructionism" and "Critical Theory". These debates entail the significance of critical reason and language in analyzing comparative and cross-cultural learning process.

PHIL/RELS 327 Spirituality, Philosophy and Science

Credit Hours: 3

Knowledge never is a definitive achievement and its production is determined by multiple factors (political domination, social and cultural conditions, fashions, inertia,). This course aims at offering a fresh analysis of the complex interactions between three dynamic fields of knowledge: science, philosophy and spirituality. Numerous scientific questions have stemmed from philosophical or spiritual reflection, and conversely many scientific results have called for philosophical insights.

Historically intertwined, the three have become distinct from each other in the past few centuries. The calls for a dialogue between them have allowed numerous epistemological issues to be recently addressed. By embracing different perspectives across disciplines and regions (as traditions of thought both East and West have interacted and been plural), this course will call into question rationalism and materialism by introducing students to works, authors and research programs proposing alternative ways of looking at the world and man.

The philosophical issues that bear on spiritual beliefs have recently attracted the growing curiosity of philosophers and scientists on key topics such as free will, the nature of consciousness, healing or the physical nature of reality. Many think that a joint effort between disciplines could benefit knowledge in the broader sense of the term. Without positing a miraculous reconciliation, this course will offer a space for the discussion and re-assessment of the relationships between science, spirituality and philosophy. Didn't the Physicist Abdus Salam claim that Rumi inspired the theory that made him win the Nobel Prize? « All atoms dance like a single sun »

RELS/ANT 100: Jamal: Islamic Aesthetics and Design

Credit Hours: 3

Islamic Art is intimately tied to the Divine Revelation, fusing truth and beauty as the same. The role of Islamic Art, according to Seyyed Hossein Nasr, is not just to provide a historical understanding of art, but to mold the soul of the artist. Taking the example of calligraphy, we can liken the calligrapher to the reed pen, where one needs to empty themselves just as a hollow pen for the Divine to flow through. The ink itself is a metaphor for the latter. This course combines Islamic calligraphy and geometry as a singular aesthetic experience called Jamal. It is an experimental course jointly taught by two traditional artists and anthropologist.

Since the earliest period, Islam's artistic traditions have given sacred geometry a place of honor. This predilection goes back to the belief that mathematics and geometry are the best vehicles of expression for true beauty, a divine and objective reality, transcending the limitations of the subjective perception of attractiveness of the nafs. Sacred geometry rather appeals to the real organ

of perception of the divine realities that is the intellect or 'aql. Using a multiplicity of simple shapes manifesting perfection, sacred geometry expresses complex concepts and gives them shape while also referring us back to the intermediary visionary realm of the imaginal world or 'alam ul'mithal, the realm between the material and the angelic world where matter becomes spiritualized and pure spirit assumes form.

In Islamic origin myth, the first thing that God created was qalam (pen). The writing holds a paramount significance in Islamic cultures. Throughout the centuries, Muslim scribes and calligraphers perfect the art of writing. In premodern Muslim societies, it was elementary learning aimed at grounding students firmly in the art and sciences of letters. The calligraphy was perceived as a spiritual exercise to cultivate perfect proportions within a soul as a reflection of divine unity. In addition to its artistic and spiritual dimensions, calligraphy became an integral aspect of the bureaucratic rationality of Ottoman, Safavid, and Mughal courts.

RELS / ANT 252 Anthropology of Religion

Credit Hours: 3

In Pakistan, when it comes to the study of religion, it is generally associated with Islamic Studies or commonly known as Islamiyat (a compulsory subject/course in a school, college and even a university) and a Madrassa. Normally, it is seen as a religious responsibility or something that is an interest of "religious people" or people who are interested in religion. Hence, producing and provoking heated feelings and strong opinions based on an understanding of religion which is generally a static entity or a singular essence. In this course we will be deconstructing such an understanding and we will learn to explore religion not as a reified or static entity but as a living experience with more than just a

singular essence. Since religion is one of the important topics in anthropology, we will focus on the themes that guide anthropology to look at religion, its role and expression in different societies. The aim is to develop the idea of the anthropological approach toward religion. To achieve the aim, we will not only focus on major conceptual approaches and debates in the study of religion but will also explore religious life in specific socio-cultural and political contexts using different ethnographic studies.

Regional Languages

LANG 101 Sindhi Sikhiya I

Credit Hours: 4

The knowledge gained through this course will help students to appreciate the enormous culture, heritage, and literature of Sindhi language. The students start as beginners to equip themselves with skills of understanding/learning a certain degree of a new language is important. So, pursuing new Language new skills, new knowledge can associate to an important five- to ten-thousand-year-old ancient language, culture, and its music thriving in modern world.

LANG 102 Punjabi Rachna I

Credit Hours: 4

The Course aims to enable the students to develop a basic understanding of Punjabi language in context to Punjabi culture, idiom, linguistic and literature. This course initiates a learning module, which will evolve in three semesters; each interlinked in a systematic row starting with emphasis on linguistics to literature and finally history of Punjabi language. This is the Elementary level of this course. Contents of the course have been designed to ensure that the students may acquire the following fundamental skills with special emphasis on:

- *Speaking*: Simple language interaction with correct pronunciation, intonation and appropriate expression.
- *Listening*: Familiarities with alphabets, articulation of sounds, correct pronunciation, vowel harmony including phrases and expressions.
- *Reading*: Correct reading for understanding Punjabi language script.

LANG 104 Introduction to Pashto - Pashto Pohana I

Credit Hours: 4

The purpose of this course is to provide students a critical and rigorous introduction to the world of Pashto Language. This involves understanding the Geographical and Historical context of Pashto and Pashtoonwali, fundamentals of Central Asian languages and key debates on the development, implementation and evaluation of Pashto. First, we will try to understand the emergence of the studies of this Central Asian language within the broader field of social sciences, its unique orientation, and its relationship to the practice of social life.

Second, this purpose would enable them to understand the rational relationship of the language Pashto to the Ancient languages. Contents of the course have been designed to ensure that the students may acquire the skills with special emphasis on speaking, interaction with correct pronunciation, intonation and appropriate expression with the major geographical dialects. Familiarities with alphabets, articulation of sounds, correct pronunciation, vowel harmony including phrases and expressions, Correct reading for understanding Pashto language script short paragraphs, situational dialogues and simple compositions.

LANG 201 Sindhi Sikhiya II

Credit Hours: 4

This intermediate course enhances students' reading and writing skills in the Sindhi language. Students will be exposed to folklore rhymes, folk songs, fables and tales, and poetry. The course will introduce major Sindhi language Sufi poets and prose writers from 1843-1947. At this level, students will learn to contextualize readings in a larger Sindhi cultural context.

LANG 202 Punjabi Rachna II

Credit Hours: 4

The Course aims to enable the students to develop a basic understanding of Punjabi language in context to Punjabi culture, idiom, linguistic and literature. This course initiates a learning module, which will evolve in three semesters; each interlinked in a systematic row starting with emphasis on linguistics to literature and finally history of Punjabi language. This is the **intermediate** level of this course. Contents of the course have been designed to ensure that the students may acquire the following fundamental skills with special emphasis on:

- *Speaking*: Simple language interaction with correct pronunciation, intonation and appropriate expression.
- *Listening*: Familiarities with alphabets, articulation of sounds, correct pronunciation, vowel harmony including phrases and expressions.
- *Reading*: Correct reading for understanding Punjabi language script.
- *Writing*: Short paragraphs, situational dialogues and simple compositions.

LANG 301 Sindhi Sikhiya III

Credit Hours: 4

Sindhi Sikhiya is an optional course. Sindhi Sikhiya III is for all those students who has passed Sindhi Sikhiya II at Habib University. The objective of this course is to help students comprehend, read and write Sindhi language. It is expected that students will be at different levels of skill in reading and writing Sindhi. In addition to the lectures and discussion groups, tutorials organized to facilitate the students in reading, comprehending, and contextualizing the texts on the reading list.

LANG 302 Punjabi Rachna III

Credit Hours: 4

The course aims to enable the students to develop a basic understanding of Punjabi language in context to Punjabi culture, idiom, linguistic and literature. This course initiates a learning module, which will evolve in three semesters; each interlinked in a systematic row starting with emphasis on linguistics to literature and finally history of Punjabi language. This is the **advanced** level of this course. Contents of the course have been designed to ensure that the students may acquire the following fundamental skills with special emphasis on speaking.

- *Speaking*: Simple language interaction with correct pronunciation, intonation and appropriate expression.
- *Listening*: Familiarities with alphabets, articulation of sounds, correct pronunciation, vowel harmony including phrases and expressions.
- *Reading*: Correct reading for understanding Punjabi language script.
- *Writing*: Short paragraphs, situational dialogues and simple compositions.

LANG 304: Pukhto Pohana III

Credit Hours: 4

Pashto Pohana III is part of a set of materials for teaching oral and written Pashto. The transcription of a word or phrase is given only when the word or phrase is introduced, or when pronunciation is the focus. Dialogues, readings and Writings on various topics are used, with accompanying presentations on grammar and vocabulary, and exercises for oral practice and conversation. The Course, which is in Pashto Urdu and English, provides background information on points in the dialogues and readings, discussion of grammar points, and information on individual vocabulary items. Each week in the course contains a number of exercises providing additional practice on the points covered in the course.

Habib University
shaping futures

DHANANI SCHOOL OF SCIENCE & ENGINEERING

Computer Science

BS Computer Science

Faculty

Abdul Samad Khan	Assistant Professor and Program Director
Shah Jamal Alam	Associate Professor
Syeda Saleha Raza	Associate Professor
Waqar Saleem	Associate Professor
Faisal Alvi	Assistant Professor
Muhammad Mobeen Movania	Assistant Professor
Muhammad Qasim Pasta	Assistant Professor
Neelma Bhatti	Assistant Professor
Maria Samad	Lecturer
Nadia Nasir	Lecturer
Abdullah Zafar	Dean's Fellow
Mohammad Salman	Dean's Fellow

Vision

The program educates students in the theory systems, and applications of CS in order to enable them to make impactful contributions to the society and prepare them for success in industry, entrepreneurship and higher education.

Program Description

Computer Science (CS) is the study of computation - what can and cannot be computed, how can computation be made more efficient, how to build machines that can compute, and which spheres of human activity can benefit from computational approaches. It is deeply rooted in logic and mathematics. Theoretical Computer Scientists push the frontiers of computation by inventing new computational approaches. Practical Computer Scientists apply the theory of Computer Science to different application areas like science, finance, medicine, business, transportation, entertainment, education, communication, engineering, art, and the humanities.

Interventions stemming from CS are just beginning to disrupt and reinvent Pakistani society. The CS program provides students the intellectual and technical foundation to assess these interventions

and to contribute meaningfully and thoughtfully to the transition of our society to the information age. With an education grounded in the Liberal Arts, our graduates have an unrivaled understanding of our society and the ethical ramifications of technology.

A major with the program educates students in the theory, systems, and applications of CS so that they are able and willing to make impactful contributions to society and are prepared for success in the industry, entrepreneurship, and higher education.

Program Educational Objectives

Computer Science program at Habib University aims to produce competent computer scientists who:

1. Have strong foundational knowledge of mathematics and computer science, and the accompanying skills both in breadth and in depth, to position themselves equally well in the Information Technology industry, as technology entrepreneurs and/or in graduate programs in Computer Science or other technical and scientific fields.
2. Have a hands-on approach to self-learning and research, and will continually update their knowledge, skills and technical know-how.
3. Will be able to assess the societal, cultural, social, religious, legal, environmental, local, and global impact of their actions and will choose an ethical course of action in their professional, personal, and daily lives.
4. Will be able to effectively communicate and collaborate with people from diverse backgrounds and in a variety of settings.

Program Learning Outcomes

Students who graduate with a degree in Computer Science will be able to:

1. **Analysis**: analyze a given situation and reduce it to one or more problems that can be solved via computer intervention.
2. **Design**: design one or more computer-based solutions of a given problem and select the solution that is best under the circumstances.
3. **Programming**: program a given solution in a variety of programming languages belonging to different programming paradigms.
4. **Implementation**: design and implement software systems of varying complexity.
5. **Tools**: work with the latest tools that support development, e.g., IDE's, version control systems, debuggers, profilers and continuous build systems.
6. **Self-learning**: research, learn and apply the requirements needed to implement a solution for a given high-level problem description.
7. **Ethics and Awareness**: foresee both the impact and possible ramifications of computing practices.
8. **Communication and Teamwork**: Communicate effectively in both writing and oral communications and work effectively in inter-disciplinary teams

Requirements for the Major – Class Of 2026

All Habib University students majoring in Computer Science (CS) must complete a minimum of 130 credits hours, with a minimum grade of **C+** in each CS Foundation and Kernel course in order to graduate with this degree. Students must also meet all other requirements set by Habib University and by the Dhanani School of Science and Engineering. Some of these may overlap. The courses are divided in the following categories:

University Requirements

All students are required to take 10 courses spanning seven forms of thought and action, called the Habib Liberal Core. Some courses in the major can also be counted towards meeting requirement of certain forms of thought in the core (e.g., Quantitative Reasoning, Formal Reasoning and Creative Practice Forms of Though). For more details, please see the section on Habib Liberal Core in the catalog.

- Formal Reasoning requirement
  Courses offered as part of the CS Foundation may be counted towards Habib Liberal Core Formal Reasoning requirements.
- Quantitative Reasoning requirement
  MATH 310 Introduction to Probability and Statistics, a Mathematics requirement for CS students, also fulfils the Quantitative Reasoning requirement of the Habib Liberal Core.
- Creative Practice requirement
  The creative practice requirement may be fulfilled through the following courses (these courses will also count towards fulfilling CS Kernel requirements): CS 224 Object Oriented Programming, CS 353 Software Engineering, CS 355 Database Systems or CS 412 Algorithms: Design and Analysis

Natural Science and Mathematics

Natural Science: Students pursuing a CS major are required to complete any two (02) Natural Science courses, at least one of which must include a lab component.

Mathematics: Students are also required to complete five (05) mathematics courses. These courses are offered by the Integrated Science and Mathematics program, and are described in the program's section.

Computer Science Foundation

CS Foundation prepare students coming out of high school to build a sound foundation of CS concepts. It comprises of three (03) required courses.

Computer Science Kernel

CS Kernel covers concepts, skills, and techniques that are fundamental to the pursuit of most disciplines and practices within CS. It comprises of eight (08) required courses

Computer Science Electives

Students are required to complete at least five (05) courses that explore various disciplines and practices within CS.

Other Requirements

All Computer Science students are required to complete the following in additional to their CS requirements:

- CS 100 Computer Science Freshman Seminar
- CS 290 *Khidmat* (field practice)
- PLAY 113 Design Your Habib Experience Seminar
- EE 172/CS 130 Digital Logic and Design

Final Year Capstone Project

CS students in their final year undertake a year-long project (completed as two courses) as the culmination of their studies in the CS major. This is completed as the 02 courses.

Professional Practice

Students must take one course fulfilling this requirement from the bucket of Economics, Entrepreneurship and Management courses.

Free Electives

Any course offered at Habib university can be attempted as a free elective.

Requirements for the Computer Science Major (Class of 2026)

Course Category	Courses	Min. No. of Courses	Min. Credit Hours
University Requirements	Habib Liberal Core*	10*	35*
Natural Science and Mathematics Requirement (07* courses)	MATH 101 Calculus I	01	04
	MATH 102 Calculus II	01	03
	MATH 202 Engineering Mathematics	01	03
	MATH 205 Linear Algebra	01	03
	MATH 310 Introduction to Probability and Statistics*	01*	03*
	Natural Science Electives	02	6+1

Course Category	Courses	Min. No. of Courses	Min. Credit Hours
Computer Science Requirements (18* courses)	**CS Foundation**		
	CS 101 Programming Fundamentals	01*	2+1*
	CS 102 Data Structures and Algorithms	01*	3+1*
	CS 113 Discrete Mathematics	01*	3*
	CS Kernel		
	CS 201 Data Structures II	01	3
	CS 212 Nature of Computation	01	3
	CS 224 Object Oriented Programming and Design Methodologies	01*	3+1*
	CS 232 Operating Systems	01	3+1
	CS 353 Software Engineering	01*	3*
	CS 355 Database Systems	01*	3+1*
	CS 412 Algorithms: Design and Analysis	01*	3*
	CS Systems Requirements	01	3+1
	Computer Science Electives	05	15^
	Final Year Capstone Project (*Kaavish*)		
	CS 491 Kaavish I	01	0+3
	CS 492 Kaavish II	01	0+3
Other Requirements (10* courses)	CS 290 *Khidmat* (field practice)	01	Non-credit
	EE 172/CS 130 Digital Logic and Design	01	3+1
	PLAY 113 Design Your Habib Experience	01	0+1
	CS 100 Computer Science Freshman Seminar	01	1+0
	Professional Practice	01	3
	Free Electives	05+	15+
	Overall	42*	130*

* Courses may overlap leading to a different total number of courses and credit hours.

^ Students *must* enroll in the lab of every 4 credit CS Elective.

+ A minimum of 130 credits are required for graduation. A sufficient number of free electives (including CS electives) must be taken to meet any credit shortfall.

Computer Science Minor

All Habib University students choosing to pursue the CS minor must complete a minimum of 7 courses totaling at least 21 credits. Requirements to complete the minor can be found in the 'Minors' section of the Course Catalog.

Course Descriptions

Required Computer Science Courses

CS 100 Computer Science Freshman Seminar

Credit Hours: 1+0
Prerequisite: None
Fulfils: CS Major Requirement

Computer Science is a rich field. Rooted in mathematics and logic, it is intellectually stimulating and its applications continue to enable the realization of diverse ideas that touch our lives in a multitude of ways. This seminar provides a broad overview of the theory and practice of Computer Science through a series of weekly seminars by researchers and practitioners.

CS 101 Programming Fundamentals

Credit Hours: 2+1
Prerequisite: None
Fulfils: CS Foundation; Formal Reasoning requirement of the Habib Liberal Core

Motivates computer programming as a means to solve problems; introduces the basic components of problem solving: repetition, decision making, data storage and manipulation, input/output, modularity, top-down design; develops expertise in the corresponding constructs – variables, data types, iteration, conditionals, functions, file and console I/O, and recursion – in a high-level programming language.

CS 102 Data Structures and Algorithms

Credit Hours: 3+1
Prerequisite: CS 101 Programming Fundamentals
Fulfils: CS Foundation; Formal Reasoning requirement of the Habib Liberal Core

Motivates the design of algorithms by exploring various algorithms for a single task: linear search and binary search, bubble sort, insertion sort, selection sort, merge sort, quick sort; introduces techniques to reason about and compare algorithms: asymptotic analysis and notation, Master theorem; introduces frequently used data structures: list, tree, graph, stack, queue; discusses and analyzes basic operations on the data structures: infix, postfix, and prefix traversal, breadth-first and depth-first search, computation of graph properties.

CS 113 Discrete Mathematics

Credit Hours: 3+0
Prerequisite: None
Fulfils: CS Foundation; Formal Reasoning requirement of the Habib Liberal Core

Equips students with essential mathematical tools that will be encountered in future Computer Science courses; develops a capacity for formal mathematical manipulation and abstract thought; topics include: propositional logic, predicate and quantifiers, sets, functions, sequences, summations, relations, partial orderings, proofs, mathematical induction, pigeonhole principle, permutations and combinations, graphs, graph isomorphism, Euler and Hamiltonian paths, and trees.

EE 172/CS 130 Digital Logic and Design

Credit Hours: 3+1
Prerequisite: None
Fulfils**:** Other requirements

CS 201 Data Structures II

Credit Hours: 3+0
Prerequisite: CS 102 Data Structure and Algorithm, CS 113 Discrete Mathematics
Fulfils: CS Kernel

Imparts proficiency in the use of commonly used data structures; introduces a few higher level data structures; develops critical judgment regarding the choice of data structures for a given situation; topics include: abstract data type, complexity, stack, queue, list, amortized analysis, array-list, linked list and skip list, hashing, binary tree, binary search tree (BST), randomized BST and treap, self-balancing in trees, AVL tree, B-tree, red-black tree, binary heap and moldable heap, Fibonacci heap, graphs and their representations, graph algorithms, tire, inverted index.

CS 212 Nature of Computation

Credit Hours: 3+0
Prerequisite: CS 113 Discrete Mathematics
Fulfils: CS Kernel

Develops the foundations for theoretical computer science; investigates fundamental challenges at the frontiers of theoretical computer science; provides opportunities to develop rigorous mathematical arguments; engages with classical ideas from theoretical computer science; topics include: proofs, languages, finite automata, grammars and push-down automata, Turing machines and the halting problem, oracles and computability, Gödel's completeness and incompleteness theorems, circuit complexity, polynomial time and its justification, reduction, P, NP, and NP-completeness, Cook-Levin theorem, hardness of the P versus NP problem, randomness, P versus BPP, interactive proofs, zero-knowledge proofs, quantum computing, DNA computing, biological computing, physical limits of computation.

CS 224 Object Oriented Programming and Design Methodologies

Credit Hours: 3+1
Prerequisite: CS 102 Data Structure and Algorithms
Fulfils: CS Kernel, Creative Practice requirement of the Habib Liberal Core

Introduces object oriented and related memory concepts; motivates C++ as the language of choice; topics include: pointers and structs, objects, heap allocation, data encapsulation, classes, namespaces, constructors and destructors, virtual functions and destructors, operator overloading and standard input/output, inheritance and polymorphism, templates, standard library containers, and software design using UML 2.0.

CS 232 Operating Systems

Credit Hours: 3+1
Prerequisite: CS 102 Data Structure and Algorithms
Fulfils: CS Kernel

The student will be taught principles of modern operating systems. In particular, the course will cover details of concurrent processes, multi-threads, CPU scheduling, memory management, file system, storage subsystem, and input/output management. This will be accomplished by integrating theory and practice through coordinated lecture and lab hours.

CS 330 Computer Architecture

Credit Hours: 3+1
Prerequisite: EE 172/CS 130 Digital Logic and Design
Fulfils: CS Kernel (CS Systems Elective)

Studies the architecture of RISC-V processor that enables general purpose computing; develops hands-on expertise in developing complex logical components; topics include: instruction set architecture, addressing modes, processor design and computer arithmetic, pipelining, memory systems, fetch-execution cycle, processor implementation on FPGA using Verilog HDL.

CS 353 Software Engineering

Credit Hours: 3+0
Prerequisite: CS 224 Object Oriented Programming and Design Methodologies, CS 355 Database Systems
Fulfils: CS Kernel, Creative Practice requirement of the Habib Liberal Core

Approaches software engineering as the study and practice of a collection of concepts, techniques and tools which enable programmers to design, build, and maintain large software systems in a reliable and cost effective way; develops skills and understanding that function as the basis for many of the more advanced analysis and design practices encountered in the industry; topics include: systems development process, stakeholders and their roles, systems development project needs, software process methodologies, spiral and RUP, software analysis and requirement discovery, data modelling, SAD and OOAD, UML, use case diagrams, software project management, project scope,

network diagrams and CPM, agile methodologies, XP, Scrum and FDD, class diagrams, realization of use cases, object oriented design, sequence diagrams, activity diagrams, state transition diagrams, user interface design, software testing, software construction and maintenance.

CS 355 Database Systems

Credit Hours: 3+1
Prerequisite: CS 102 Data Structure and Algorithms
Fulfils: CS Kernel, Creative Practice requirement of the Habib Liberal Core

Explores in detail the theoretical and practical aspects of Relational Database Management Systems (RDBMS); develops an understanding of database modeling, relational algebra, structured query language (SQL), components of Database Management System (DBMS), transaction management and concurrency control, database fine-tuning via indexing and partitioning, and database connectivity with front-end applications; discusses administrative aspects of database systems including database security, database management vs data warehousing vs data mining, and big data and its challenges.

CS 412 Algorithms: Design and Analysis

Credit Hours: 3+0
Prerequisite: CS 201 Data Structures II, MATH 310 Probability and Statistics
Fulfils: CS Kernel, Creative Practice requirement of the Habib Liberal Core

Develops tools and techniques that aid in designing correct, efficient algorithms for computational problems and analyzing their correctness and running time; some of the discussed techniques are: greedy method, divide-and-conquer, dynamic programming, hashing, randomization, network flows, linear programming, Fast Fourier Transform, and techniques for thinking about solving problems in parallel; analysis tools include: recurrences, probabilistic analysis, amortized analysis, and potential functions.

CS 491 Kaavish I

Credit Hours: 0+3
Prerequisite: CS 353 Software Engineering
Fulfils: CS Capstone

Self-directed final year project carried out under the supervision of a faculty member; emphasizes solving a real-world problem; integrates knowledge and skills accumulated over the entirety of the degree; first of a 2-part sequence.

CS 492 Kaavish II

Credit Hours: 0+3
Prerequisite: CS 491 Kaavish I
Fulfils: CS Capstone

Self-directed final year project carried out under the supervision of a faculty member; emphasizes solving a real-world problem; integrates knowledge and skills accumulated over the entirety of the degree; second of a 2-part sequence.

Elective Courses

CS/SDP 262 Introduction to Computational Social Sciences

Credit Hours: 3+0
Prerequisite: None
Fulfils: CS Elective

Social systems are sources of complexity in themselves in the sense that interactions between individuals may give rise to unexpected and unpredictable outcomes at the system's level. Recent technological advances coupled with the availability of faster and cheaper internet services have opened new research frontiers and challenges for social and behavioral scientists in understanding human social interaction – one way of understanding the interplay of such interactions is through simulating (some) aspects of the target system, whether it is from real or a virtual world. Agent-based social simulation is a modeling technique that is suitable for analyzing such systems, by capturing individual behavior (micro-level) and observing the generated behavior at the macro-level.

CS 316 Introduction to Deep Learning

Credit Hours: 3+1
Prerequisite: MATH 205 Linear Algebra, MATH 310 Probability and Statistics
Fulfils: CS Elective

Deep learning is a key enabler of AI powered technologies being developed across the globe, and it is opening immense economic opportunities in the field of intelligent systems. We need to equip our students to understand and develop these systems. This course will provide a practical introduction to deep learning.

CS 324 Advanced Programming in Java

Credit Hours: 3+0
Prerequisite: None
Fulfils: CS Elective

Real-world software projects are large scale and needed to be robust and optimized, such project use efficient data structures, provide graphical interface, deploy a complex database, and communicate over network. This is a rigorous programming course aimed to develop advance programming skills using various libraries provided by Java, which is the backbone and foundation for numerous software tools. It is widely used for both open-source and commercial software projects due to its strengths: platform independent, multi-threaded, object oriented, secure and robust. A sound understanding of object-oriented concepts is essential.

CS 326 Mathematics for Machine Learning

Credit Hours: 3+0
Prerequisite: MATH 205 Linear Algebra, MATH 310 Probability and Statistics
Fulfils: CS Elective

Machine learning is turning the Artificial Intelligence dream into reality. The understanding and creation of machine learning algorithms requires Linear algebra concepts as key. This course reviews Linear Algebra with applications to probability, statistics and optimization- and above all a full explanation of deep learning.

CS 340/MATH 321 Geometrical Modelling and Analysis

Credit Hours: 3+0
Prerequisite: MATH 205 Linear Algebra, MATH 202, CS 224 Object Oriented Programming and Design Methodologies
Fulfils: CS Elective

This course will cover the foundations of geometrical modelling and analysis, with examples from elasticity, electrostatics, and computer science. The course content can broadly be divided into three categories: fundamentals of geometrical modelling, discretizing a partial differential equation, and stability of solutions.

CS 351 Artificial Intelligence

Credit Hours: 3+0
Prerequisite: CS 201 Data Structures II, CS 224 Object Oriented Programming and Design Methodologies
Fulfils: CS Elective

Studies the major areas of artificial intelligence (AI): problem-solving, decision-making, learning, planning, and reasoning; topics include: intelligent search techniques, games and adversarial search using minimax and alpha-beta pruning, supervised learning via decision trees, naive Bayes, artificial neural networks, K-means clustering, reasoning via first-order logic, Bayesian networks, evolutionary algorithms; explores the areas of computer vision, robotics, and deep learning; applies the covered AI techniques to real-world problems.

CS 363 Networks, Games, and Collective Behavior

Credit Hours: 3+0
Prerequisite: CS 102 Data Structures and Algorithms, CS 113 Discrete Mathematics
Fulfils: CS Elective

Studying network dynamics has become increasingly important in understanding the transient dynamics of multi-relational networks, in which human society is embedded. From an engineering point of view, it touches upon the design of autonomous and multi-agent systems, whereby agents make strategic choices when forming network ties to exhibit collective behavior and solve complex problems in a distributed environment. This course brings an interdisciplinary perspective by

combining foundations of network science, game theory, and computational social choice, to study networked systems exhibiting collective behavior and thus aims at exploring the micro-macro link from a theoretical and an applied lens.

CS 370 Web and Mobile Development

Credit Hours: 3+0
Prerequisite: CS 224 Object Oriented Programming and Design Methodologies, CS 355 Operating Systems
Fulfils: CS Elective

Web and App development are basic building blocks of the IT Industry in today's world. Every IT graduate is expected to have expertise on how they can get information up on the web and mobile. This course will cover the practical aspect of how a student can create web applications and an intro to the mobile app development world using hybrid web technology.

CS 400 Computer Science Senior Seminar

Credit Hours: 1+0
Prerequisite: None
Fulfils: CS Elective

Computer science continues to spawn new areas that generate a lot of research and find interesting applications in our lives. To eventually contribute to this growing body of knowledge, students of computer science must be equipped with the skills and practices to approach, understand, and communicate research papers. This seminar provides students a broad overview of selected topics in computer science while developing their skill to read, understand, and present research papers and presentation.

CS 432 GPU Accelerated Computing

Credit Hours: 3+0
Prerequisite: CS 232 Operating Systems, MATH 205 Linear Algebra
Fulfils: CS Elective

This course teaches the fundamental tools and techniques for accelerating C/C++ applications to run on massively parallel GPUs with CUDA®. Students will learn how to write code, configure code parallelization with CUDA, optimize memory migration between the CPU and GPU accelerator, and implement the workflow that they have learned on a new task—accelerating a fully functional, but CPU-only, particle simulator for observable massive performance gains.

CS 440 Computer Graphics

Credit Hours: 3+0
Prerequisite: CS 224 Object Oriented Programming and Design Methodologies, CS 412 Algorithms: Design and Analysis, MATH 205 Linear Algebra
Fulfils: CS Elective

This course presents some of the basic techniques in Computer Graphics and focuses on two particular rendering approaches: pipeline rendering using a graphics API and realistic rendering using ray tracing.

CS 451 Computational Intelligence

Credit Hours: 3+0
Prerequisite: CS 351 Artificial Intelligence
Fulfils: CS Elective

Studies different nature-inspired computational methods; provides hands-on experience of applying these techniques to solve complex optimization problems; topics include: evolutionary computation, swarm intelligence, reinforcement learning, fuzzy logic, and artificial neural networks.

CS 457 Data Science Techniques

Credit Hours: 3+0
Prerequisite: CS 355 Database Systems, MATH 310 Probability and Statistics
Fulfils: CS Elective

Develops the skills to leverage statistics and programming to make predictions, optimize outcomes, and help guide business decisions using data; explores techniques for drawing conclusions and predicting outcomes from data; provides hands-on exposure to an ecosystem of powerful tools that apply data science techniques to real data sets; topics include: data manipulation, data visualization, supervised and unsupervised learning, descriptive and inferential statistics, and data visualization.

CS 4xx Applied Digital Image Processing

Credit Hours: 3+0
Prerequisite: CS 102 Data Structures and Algorithms, CS 224 Object Oriented Programming and Design Methodologies
Fulfils: CS Elective

This course will teach applied digital image processing to senior undergraduate students. The course will take a project-based approach. Students will be able to apply and learn by doing things practically in (preferably) MATLAB or Python/C++, whichever is available.

MGMT 304 Fundamentals of Intellectual Property

Credit Hours: 3+0
Prerequisite: None
Fulfils: Professional Practice requirement

A primary purpose of this course is to raise awareness of Intellectual Property (IP) amongst students and to introduce the topic of IP, associated law, and some of its primary branches, to a non-legal (e.g. STEM, social sciences, design, liberal arts) audience so that they may effectively navigate through the landscape of various intellectual property regimes and related family of (legal) rights (IPR). Whilst these rights are rooted in law, intellectual property education has branches which touch many areas of academic research and commercial activity, including: economics, finance, taxation, human rights,

ethics, education, governance and management. Studying intellectual property in a non-law curriculum can be seen as an 'opportunity' to engage with a vital topic that links commercial, legal and technical disciplines. Another important purpose of this course is to introduce students to the increasingly important area of IP management (and IP strategy). IP and intangible assets are driven by investments in R&D, advertising and marketing, education and training, management information systems, organizational structure, and so on. The development of such assets can involve invention or some other creative step, as well as innovation. The investments and the activities involved are all inherently risky. Thus, understanding the management of IP and intangible assets requires inputs from a variety of disciplines, including economics, law, accounting and finance, management, and so on. An exposure to some key tactics on the strategic management of IP supplemented with relevant IP management case studies can be of immense value in todays and tomorrow's expanding ecosystem.

MGMT 320 Principles of Management

Credit Hours: 3+0
Prerequisite: None
Fulfils: Professional Practice requirement

The course on Principles of Management for Tech Professionals introduces management as a discipline and process to tech professionals. This course includes evolution and scope of management, decision-making, planning, strategy, organizing, staffing, leading, control, change, and the importance of management in the global environment and ethical considerations of management decisions. Hence, the course provides a framework that will enhance a person's effectiveness in the business.

MGMT 321 Engineering Project Management

Credit Hours: 3+0
Prerequisite: None
Fulfils: Professional Practice requirement

Through using textbook, discussions, assignments and real-world examples, the engineering professionals will learn how to identify, define, plan, execute, monitor, control, and close projects. They will build project components, organize work efficiently, effectively and help them to control changes. The students will use tools to build works schedules, allocate resources and manage cost of any project. This will help them to get a hands-on training of using project management tools for the smooth flow of various stages of project that is the need of time and most demanded skill by the employers all around the world.

MGMT 322 Operations Management

Credit Hours: 3+0
Prerequisite: None
Fulfils: Professional Practice requirement

The course aims to provide an understanding to identify, define, plan, execute, monitor, control, optimize and improve operations and processes in both manufacturing and service industries. For many different types of operations either in the tangible goods industry or the intangible service industry, this course aims to familiarize students with the major operational issues that challenge entrepreneurs and managers and provide them with the basic language, concepts, insights, and analytical tools to deal with these issues.

MGMT 322 Supply Chain Management

Credit Hours: 3+0
Prerequisite: None
Fulfils: Professional Practice requirement

The course aims to provide an understanding of fundamental concepts of supply chain management. All functional areas of supply chain management are explored in an integrated view of procurement, manufacturing and operations management, transportation and logistics, inventory and warehousing, demand planning, scheduling, network design, collaboration, and performance measurement. Topics may also cover supply chain financial metrics, strategy, and risk management for demand-driven value networks.

Electrical Engineering

BS Electrical Engineering

Faculty

Ahmad Usman	Assistant Professor and Program Director
Aamir Hasan	Associate Professor
Ishtiyaq Ahmed Makda	Associate Professor
Mohammad Shahid Shaikh	Associate Professor
Shafayat Abrar	Associate Professor
Abdul Basit Memon	Assistant Professor
Haleema Qamar	Assistant Professor
Tariq Mumtaz	Assistant Professor
Junaid Ahmed Memon	Lecturer
Haseeb Shaikh	Dean's Fellow and Lecturer

Vision

Be an agent of positive change in society through excellence in locally contextualized and globally competitive liberal-arts and discipline-specific education and research, and imparting an understanding of contemporary issues and challenges facing the society.

Program Description

The BS Electrical Engineering degree is offered as part of the comprehensive Electrical and Computer Engineering (ECE) program, which offers a robust and multidisciplinary curriculum that includes strong theoretical fundamentals and practical problem-solving. Our program is recognized for shaping students to be the next leading electrical engineers. The uniqueness of our engineering program hinges on sound and contextualized liberal arts exposure that provides the mold for a 'great engineer'.

The Electrical Engineering Program at Habib University is recognized and accredited by Pakistan Engineering Council.

The ECE program aims to offer electives in all possible sub-disciplines within Electrical Engineering, but there is a specific focus on the following areas. Students can concentrate their degree in one of these areas, by appropriately choosing electives in that area. The elective courses can be selected in consultation with their academic advisor.

Information Systems and Robotics

Information systems area forms a bridge between information processing systems and physical systems. It includes areas such as Control, Signal Processing, and Vision-based systems. Signal Processing focuses on analyzing, modifying, and synthesizing information. Control theory helps us understand systems with feedback signals, and essentially allows us to design means to control them and make them behave in the desired manner. Robotics is, in fact, an interdisciplinary area involving Electrical Engineering, Computer Engineering, Mechanical Engineering, and Computer Science. Robotic systems are increasingly being employed in all areas of life. With the ever-increasing utilization of robotic systems, the demand for properly trained engineers in robotics is also increasing.

Electronics and Embedded Systems

Electronic systems are ubiquitous in today's consumer, industrial, automotive, medical, commercial, and military devices. Even traditional mechanical systems today, such as automobiles, cannot function without electronics. This trend of 'electronification' of society in the form of smart homes, smart cities, smart grids, coupled with the availability of inexpensive but powerful embedded systems, opens up a huge valley of opportunities for well-trained electronic engineers and entrepreneurs.

Power and Energy Systems

The ready availability of electrical power at a reasonable price is essential for a country's economic development. To come out of the current energy crisis, Pakistan needs thoughtful electrical engineers with technical expertise in the area of energy systems (power generation, transmission, distribution, renewable energy, power electronics), and the contextual awareness to develop the best possible solution to our crisis.

Telecommunications & Networks

Cellular mobile phone networks, satellite and fiber-optics communication systems, and global positioning systems play a fundamental role in increasing the quality of life and improving the efficiency of the service sector. A well-knit telecommunications infrastructure is essential for the economic development of a country. In Pakistan, we are witnessing the introduction of 4G LTE and 5G cellular phone systems, the proliferation of data networks, and a shift towards electronically facilitated services by both the public and private sector. Telecommunications thrust is intended to sustain the positive growth in this industry by providing adequately trained technical managers, leaders, and entrepreneurs.

Program Educational Objectives

The Electrical and Computer Engineering program at Habib University aims to produce competent electrical engineers and computer engineers who:

1. Exhibit broad-based **technical excellence** in their engineering practice and in other professional dealings.
2. Are aware of the impact of their work on **society and environment**.
3. Are capable of leading through a **pluralistic approach**.
4. Engage in the lifelong process of **independent and reflective learning**.

Program Learning Outcomes

The Program Learning Outcomes (PLO) are designed to prepare graduates to attain the program educational objectives and subsume the PLOs of Pakistan Engineering Council (PEC) and Accreditation Board for Engineering and Technology (ABET).

The EE program at Habib University aims to produce electrical engineers who, at the time of graduation, have the following abilities:

1. **Engineering Knowledge**: an ability to apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems;
2. **Problem Analysis**: an ability to identify, formulate, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering;
3. **Design of Solutions**: an ability to design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations;
4. **Investigation**: an ability to investigate complex engineering problems in a methodical way including literature survey, design and conduct of experiments, analysis and interpretation of experimental data, and synthesis of information to derive valid conclusions;
5. **Modern Tool Usage**: an ability to create, select and apply appropriate techniques, resources, and modern engineering tools, including prediction and modelling, to complex engineering activities with an understanding of the limitations;
6. **Contextual Awareness**: an ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solution to complex engineering problems;
7. **Environment and Sustainability**: an ability to understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate knowledge of and need for sustainable development;
8. **Ethics**: ability to apply ethical principles and commit to professional ethics, responsibilities, and norms of engineering practice;

9. **Collaboration**: an ability to work effectively, as an individual or in a team, on multifaceted and/or multidisciplinary settings;
10. **Communication**: an ability to communicate effectively, orally as well as in writing, on complex engineering activities with the engineering community and with society at large;
11. **Project Management**: an ability to demonstrate management skills as a member and/or leader in a team, to manage projects in a multidisciplinary environment;
12. **Lifelong Learning**: an ability to recognize importance of, and pursue lifelong learning in the broader context of innovation and technological developments.

Requirements for the Electrical Engineering Major – Class Of 2026

All students majoring in *Electrical Engineering* are required to complete 44 courses and a minimum of 134 credit hours of coursework, and achieve a minimum CGPA of 2.33. The courses are divided in the following categories:

University Requirements

All students are required to take 10 courses spanning seven forms of thought and action, called the Habib Liberal Core. Some courses in the major can also be counted towards meeting requirement of certain forms of thought in the core. For more details, please see the section on Habib Liberal Core in the catalog.

Science, Mathematics and Computing Requirements

These courses in Mathematics, Physics, other Natural Sciences, and Computer Science provide the foundations for future Electrical Engineering courses as well as expand multidisciplinary breadth of students. Some of these courses can be counted towards minors in Mathematics, Physics, or Computer Science.

Electrical Engineering Foundation

This set of courses prepares students in the requisite analysis techniques and abstract methods required to understand and design all Electrical Engineering systems.

Electrical Engineering Core

Electrical Engineering is an immensely vast discipline and offers a diverse set of exciting sub-disciplines: Energy and Power Systems, Digital Electronics, Analog Electronics, Electronic Devices, Instrumentation, Communication, Control Systems, Robotics, Signal Processing, Embedded Systems, Optics, Power Electronics, Bioengineering, Microwave Engineering, to name a few. The core ensures that students take at least one course in a number of these sub-disciplines. Additionally, the Electrical Engineering seminar is offered in students' junior year to expose them to a diverse set of sub-disciplines within EE. Students also take five electives to develop greater breath or depth in one or more of these areas.

Design in Engineering

This set of courses on equipping students with design tools necessary to be a designer of effective solutions. Students will receive training on design processes, practice human-centered design, explore systems thinking to construct a big picture of complex systems, and apply these ideas on real-world systems and problems in communities.

Other Requirements

The interdisciplinary nature of engineering problems today require that Electrical Engineers are aware of and can work together with engineers from other disciplines. So, students are also required to take courses in engineering disciplines other than ECE, such as Mechanical, Civil, Aerospace, Environmental, to expand their knowledge base across disciplines and courses for their professional development, in disciplines including but not limited to Economics, Management, Entrepreneurship.

Requirements for the Electrical Engineering Major (Class of 2026)

Course Category	Courses	Min. No. of Courses	Min. Credit Hours
University Requirements	Habib Liberal Core*	10*	32*
Science & Math Requirement	MATH 101 Calculus I	01	4+0
	MATH 102 Calculus II	01	3+0
	MATH 202 Engineering Mathematics	01	3+0
	MATH 205 Linear Algebra	01	3+0
	EE 354 Introduction to Probability & Statistics*	01*	3+0*
	PHY XXX Physics of Semiconductors	01	3+0
Computing Requirement	CS 101 Programming Fundamentals*	01*	2+1*
	CS 102 Data Structures and Algorithms	01	3+1
	CS 224 Object Oriented Programming and Design Methodologies	01	3+1
Engineering Requirements	**Circuits and Electronics**		
	EE 100 Introduction to Electrical & Computer Engineering	01	0+2
	EE 112 Electric Circuits I	01	2+0
	EE 113L Electric Circuits II Lab	01	0+1
	EE 211 Basic Electronics	01	3+1
	EE 213 Electric Circuits II	01	3+0

Course Category	Courses	Min. No. of Courses	Min. Credit Hours
	Digital Systems		
	EE 172 Digital Logic Design	01	3+1
	EE 371 Computer Architecture	01	3+0
	EE 376 Microcontrollers & Interfacing	01	0+1
	Systems Theory		
	EE 252 Signals & Systems	01	3+1
	EE 322 Analog & Digital Communication	01	3+1
	EE 361 Feedback Control Systems	01	3+1
	Power Systems		
	EE 241 Electromagnetic Theory	01	3+0
	EE 331 Electrical Machines	01	3+1
	EE 335 Power Generation, Transmission & Distribution	01	3+1
	Design		
	PLAY 113 Design Your HU Experience	01	0+1
	ENGR 291 Engineering Workshop & Design	01	0+1
	EE 391 Engineering Design & Innovation*	01*	0+2*
Engineering Electives	Electrical Engineering Electives	05	15+3^
	Interdisciplinary Engineering Elective (IDEE)	01	3+0
Capstone Design Project	EE 491 Capstone Design Project I	01	0+3
	EE 492 Capstone Design Project II	01	0+3
Other Engineering Requirements	EE 301 Electrical & Computer Engineering Seminar	01	1+0
	Professional Practice Electives	02	5+0
	Overall	44	134

* Double Counted towards Liberal Core Requirements

** Courses may overlap leading to a different total number of courses and credit hours.

^ Elective courses could be offered with or without labs (3 or 4 credits). Labs are mandatory if offered, and at least three of the selected electives should have accompanying labs.

Course Descriptions

Required Courses

EE 100/CE 100 Introduction to Electrical & Computer Engineering

Credit Hours: 0+2
Fulfils: EE foundation, CE foundation, ECE Minor foundation
Corequisite: CS 101 Programming Fundamentals

Through a series of projects, this course aims to expose the students, having little or no prior exposure, to the fascinating world of electrical and computer engineering. The course will allow the students to gain an appreciation for the history and possible futures of various disciplines within electrical and computer engineering. Students will spend most of their time in the lab working on these projects with classroom instruction for support. The course will introduce basic electrical concepts including charge, voltage, current, energy, power, resistance, capacitance, inductance, and Kirchoff's laws. Practical digital and analog electronic systems will also be introduced to illustrate advanced topics that are treated completely in subsequent electrical engineering courses.

EE 112/CE 112 Electric Circuits I

Credit Hours: 3+1
Fulfils: EE Foundation, CE Foundation, ECE Minor Foundation

This course introduces basic DC and AC steady-state analysis for linear circuits. Topics discussed in this course include circuit elements, Ohm's law and Kirchhoff's laws, node and mesh analysis, energy storage elements, Thevenin and Norton theorems, Phasors and sinusoidal steady state analysis. Computer applications in circuit simulation and numerical solution is also discussed.

EE 172/CE 130 Digital Logic and Design

Credit Hours: 3+1
Fulfils: EE Core, CE Core, ECE Minor Concentration Foundation
Prerequisite: None

Introduction to the design of digital hardware, realization of computation with logic gates; Boolean algebra, design of combinational logic circuits, and analysis and design of clocked sequential logic circuits, circuits for arithmetic operations; introduction to hardware description language and its application to logic design. *(Cross-listed with CS 130.)*

EE 213 Electric Circuits II

Credit Hours: 3+1
Fulfils: EE Foundation, ECE Minor Concentration Foundation
Prerequisite: EE 112/CE 112 Electric Circuits I

This course is a continuation of EE 111, Electric Circuit Analysis. The course discusses DC and AC transient analysis, sinusoidal steady state analysis of RC, RL, and RLC circuits, AC circuit power

analysis, polyphase circuits and magnetically coupled circuits. The course then introduces the students to s-domain analysis techniques and ends with a discussion of frequency responses.

EE/CE 211 Basic Electronics

Credit Hours: 3+1
Fulfils: EE Core, CE Foundation, ECE Minor Concentration Foundation
Prerequisite: EE 112/CE 112 Electric Circuits I

The course aims to introduce students to semiconductor devices, with emphasis on application of these devices in realizing analog and digital electronic circuits. The course starts with an introduction to semiconductors, energy bands, valence bonds, doping, n-type and p-type semi-conductors. The electronic devices, such as PN junction diode, bipolar junction transistor (BJT) and Metal-oxide semiconductor field-effect transistor (MOSFET), along with their applications are discussed in detail. Biasing circuits, single transistor amplifiers and their frequency are also discussed. Circuit simulations using PSpice (OrCAD) forms an important bridge between the theory discussed in class and lab experiments.

EE 241 Electromagnetic Theory

Credit Hours: 3+0
Fulfils: EE Core, ECE Minor Elective

The study of electrostatic and magneto-static fields in free and material spaces; solving boundary-value problems; extension of static fields to time-varying fields and electromagnetic waves; Maxwell's equations; propagation of electromagnetic waves through different types of media (unbounded media and guided structures) and their behavior at the interfaces.

EE 252/CE 251 Signals and Systems

Credits Hours: 3+1
Fulfils: EE Foundation, CE Core, ECE Minor Concentration Foundation
Prerequisite: MATH 101 Calculus I

The topics covered in this course include types of signals; unit impulse and unit step functions; linear time invariant (LTI) systems and their properties; convolution sum and convolution integral; Fourier series, Fourier, Laplace and Z transforms; analysis and characterization of LTI systems using various transforms, Sampling.

EE 301/CE 301 Electrical & Computer Engineering Seminar

Credit Hours: 1+0
Fulfils: EE Core, CE Core

Through a series of weekly seminars by researchers and engineers working in the domain of Electrical Engineering, this course achieves the following objectives:

- Exposure to various sub-disciplines in Electrical Engineering, their corresponding electives at HU, and that state of research in that sub-discipline;

- Strengthen the commitment to professional and ethical practice of engineering;
- Awareness of some theoretical ideas in Electrical Engineering, not covered in other courses.

EE 322 Analog and Digital Communication

Credit Hours: 3+1
Fulfils: EE Core, ECE Minor Elective
Prerequisite: EE 252/CE 251 Signals and Systems

Introduction to fundamental principles underlying the analysis, design and optimization of analog and digital communication systems; modulation techniques for analog and digital communication; effects of interference and noise and their suppression.

EE 331 Electrical Machines

Credit Hours: 3+1
Fulfils: EE Core, ECE Minor Elective
Prerequisite: EE 212, EE 241 Electromagnetic Theory

This is the first course on DC and AC electromechanical systems. Specific topics include single-phase and three-phase transformers, general structure and physical principles underlying electric drive systems, brushless, stepper and switched reluctance DC motors, DC generators, Induction and Synchronous AC motors and generators, torque-speed characteristics of motor drives. Mathematical modeling and speed control of electrical machines will also be discussed.

EE 335 Power Generation, Transmission, and Distribution

Credit Hours: 3+1
Fulfils: EE Core, ECE Minor Elective
Prerequisite: CE 211/EE 211 Basic Electronics, EE 212

The development of electrical power systems has immensely contributed to the technological advances of the humankind over the past century. Electrical power provides clean and convenient energy to the modern society, which is necessary for the realization of the luxuries we are enjoying in this world today. In summary, the modern world and society does not exist without the availability of electricity. The purpose of this course is to provide the students with a complete flavor of the full-spectrum of electric power generation, transmission, and distribution systems.

EE 354/CE 361 Introduction to Probability and Statistics

Credit Hours: 3
Fulfils: EE Foundation, CE Core
Prerequisite: MATH 102

Set theory and counting principles, axiomatic definition of probability, independence and conditional probability, Bayes' theorem; random variables (RVs) and their cumulative distribution function, probability mass functions, probability density functions and moments; joint RVs; limits theorems; statistics; applications. *(Cross listed with MATH 310)*

EE 361/CE 353 Feedback Control Systems

Credit Hours: 3+1
Fulfils: EE Core, CE Elective, ECE Minor Elective
Prerequisite: EE 252, MATH 202

Topics include: Models of dynamic systems, linear time-invariant (LTI) and transfer function models; impulse, step, transient and steady-state response; root locus technique, Bodé plots, Nyquist criterion; gain and phase margins, Nichols charts, lead, lag compensation; state-space techniques; simulation and controller design using MATLAB and Simulink.

EE 371 /CE 321 Computer Architecture

Credit Hours: 3+0
Fulfils: EE Core, CE Core, ECE Minor Elective
Prerequisite: EE 172 /CE 130 Digital Logic and Design

Studies the architecture of processors that enable general purpose computing and develops hands-on expertise in developing complex logical components. Topics include instruction set architecture, addressing modes, processor design and computer arithmetic, pipelining, memory systems, fetch execution cycle, processor implementation on FPGA using Verilog HDL.

EE 376/CE 331 Microcontrollers and Interfacing

Credit Hours: 0+1
Fulfils: EE Core, CE Core, ECE Minor Elective
Prerequisite: EE 172 /CE 130 Digital Logic and Design

Microcontrollers play a central role in modern life, controlling everything from the engine of a car, to domestic and office machinery. Microcontroller fundamentals including architecture, assembly language programming, and interfacing. Applications of industry-standard microcontrollers in embedded systems. Employs software design tools, simulators, and hardware trainers. Will focus on interfacing the ARM RISC processor to motors, actuators and sensors.

EE 391/CE 391 Engineering Design and Innovation

Credit Hours: 0+2
Fulfils: EE Design, CE Design

This course aims to cultivate skills needed to produce great designs, be a more effective engineer, and communicate with high emotional and intellectual impact. This is accomplished by working on projects centered around a locally contextualized wicked problem and students are expected to develop a solution to their identified problem by the end of semester. During the course of the semester, students will study and apply techniques suited for various steps of the design process. Students will come to appreciate that a design problem involves multiple stakeholders, come to terms with the ambiguity that shows up in design problems, make decisions in presence of multiple conflicting objectives and constraints, handle uncertainty, think as part of a team, learn how to manage the progress of their project, and communicate their design effectively.

EE 491/CE 491 Capstone Project I

Credit Hours: 0+3
Fulfils: Design in Engineering, Design Project
Prerequisite: ENGR 291, EE375, EE391

By the senior year, students have acquired sufficient breadth in Electrical Engineering (EE) and are on their way to acquire depth in one or more areas of specialization through technical electives. Intellectual maturity also requires that students understand their education in the broader context of the world and are prepared to make committed choices as participants of this complex world. The capstone design project, offered as a two semesters sequence, provides students with an opportunity to reflect on their entire educational experience, integrate the knowledge and skills acquired in earlier years, form connections within and across disciplines, and synthesize a solution to a problem connecting them to the broader issues of their discipline as well as the world they're about to enter.

EE 492/CE 492 Capstone Project II

Credit Hours: 0+3
Fulfils: Design in Engineering, Design Project
Prerequisite: EE 491/CE 491 Capstone Project I

This year-long sequence represents the culmination of study towards the BS degree. Students work individually or in small teams on a project in which they utilize the knowledge acquired during the first three years of education. Each project is closely supervised by a faculty member and each team produces a comprehensive report at the end of the project.

ENGR 291 Engineering Workshop

Credit Hours: 0+1
Fulfils: EE Design, CE Design, ECE Minor Foundation

This course aims to introduce students to hands-on engineering skills, necessary for creating their own prototypes. Topics covered in this course include introduction to engineering design process, shop safety, engineering drawing, solid modeling (CAD), 3D printing, effective use of basic hand tools such as saws and files, machining (Lathe, Milling, Drill press), CNC machining, soldering techniques, and PCB design and printing. The course work emphasizes practical skills through lab activities and project. Students will be required to work with different materials including metal, wood, and plastic.

Engineering Elective Courses

EE 365 Industrial Instrumentation & Measurements

Credit Hours: 3+1
Fulfils: EE Elective, CE MDEE, ECE Minor Elective

In this course, students will learn measurement techniques applied to instruments used both in laboratory and industry with more focus on fundamentals principles which are key to modern day instrumentation. This course will introduce the function, operation, and application of common

electrical/electronic instruments, measurement principles, and statistical analysis. Students will investigate the fundamental limitations of data acquisition systems and recognize and predict aliasing and quantization errors associated with the digital representation of analog signals

EE 366/CE 366 Introduction to Robotics

Credit Hours: 3+1
Fulfils: EE Elective, CE Elective, ECE Minor Elective
Prerequisite: MATH 205 Linear Algebra

Robotics is a multi-disciplinary area involving ideas from mechanical engineering, electrical and computer engineering, and computer science. This course is a breadth-first course designed to be the first course in the series of robotics courses. The goal of the course is to acclimatize the students with the area of robotics and to get them started on building robots. Topics covered include: forward and inverse kinematics, velocity kinematics, singularities, trajectory generation, actuation mechanisms, robot vision, feedback control, motion planning, control architectures, perception, localization, and locomotion.

EE 422 Wireless and Mobile Communication

Credit Hours: 3
Fulfils: EE Elective, ECE Minor Elective
Prerequisite: EE 322 Analog & Digital Communication

This course aims to introduce wireless communication to EE students. The route to this introduction is through the concepts of the most pervasive wireless communication system - Cellular Mobile Networks. The course comprises of wireless communications basics, systems standards, architecture and topologies. The course includes cellular concepts, traffic engineering, radio waves propagation, study of different propagation Models and coverage analysis under different types of channel models, fading and Multipath scenarios.

EE 424/CE 341 Data Communication & Networking

Credit Hours: 3+1
Fulfils: EE Elective, CE Core, ECE Minor Elective

It is the first course on networking therefore no prior background is expected. This course will not only introduce students to the basics of the communication of data in the networks of computer but will also enable to develop some insight towards the core issues related to the communication models and different network devices.

EE 427 Cellular Internet of Things in 5G

Credit Hours: 3+1
Fulfils: EE Elective, CE Elective, ECE Minor Elective

This course is designed to introduce and deepen student's understanding on the essentials of Internet of Things (IoT) Devices communicating with and without being attached to the cellular Networks, specifically with the Fifth Generation (5G) Cellular Networks. Moreover, dealing with IoT

devices as the terminals, would expose students to the entire stack of protocols i.e from Physical to the Application layer. The course is aimed to inculcate a deep understanding about the Cellular Internet of things (IoT) Networks, lay the foundation of Machine Type Communications (MTC) by framing different IoT scenarios and expose students to evolution of MTC into a massive MTC use case for 5G.

EE 432 Power Electronics

Credit Hours: 3+1
Fulfils: EE Elective, ECE Minor Elective
Prerequisite: EE 211 Basic Electronics

This course aims to familiarize students with the power semiconductor devices (power diodes and transistors), their construction, electrical characteristics, operating-principle, and their various industrial and commercial applications. Along with good mathematical skills, students must be familiar with the fundamental understanding of electronic components; for instance, an inductor and a capacitor. The topics covered in the course are: Power Semiconductor Devices; AC to DC Converters (Uncontrolled Rectifiers); AC to DC Converters (Controlled Rectifiers); AC to AC Converters; DC to DC Converters; DC to AC Converters (Inverters).

EE 433 Power Electronics – System Design

Credit Hours: 3+0
Fulfils: EE Elective, ECE Minor Elective

Power electronics is widely used in automotive, industrial and renewable energy applications; for instance, electrical vehicles, uninterruptible power supplies, and fuel-cell application. High-efficiency, low cost, and small size are some of the important design goals for any converter design; however, they of course need to comply with the electromagnetic interference (EMI) requirements. High efficiency in power converters can only be achieved by means of optimized converter design (specially the magnetic components) which then further calls for a well-engineered EMI filters. This course is mainly divided in to two parts. The first part deals with the basic circuit operations of various well-known power converters, and their analysis and design. Next, EMI noise issues in power converters will be treated in extensive details. EMI noise models for isolated power converters will be established and analyzed to build optimized EMI filters.

EE 451 Digital Image Processing

Credit Hours: 3+1
Fulfils: EE Elective, CE Elective, ECE Minor Elective
Prerequisite: CS 224 Object Oriented Programming

This course is developed for EE, CE, and CS students to introduce them the fundamental concepts, principles and techniques of digital image processing and their applications to solve real world problems. After completing the course students will be familiar with the key components of image processing system starting from image acquisition to image enhancement and restoration to

morphological processing and segmentation till image representation, description and object classification. The course offers great opportunities in Final Year Projects

EE 452 Computer Vision

Credit Hours: 3+0
Fulfils: EE Elective, CE Elective, ECE Minor Elective
Prerequisite: EE 451 Digital Image Processing, MATH 205 Linear Algebra

Have you ever wondered how a machine or computer is made capable of understanding, interpreting and giving semantics to an image/video? Have you ever thought how image/video could be used to automate processes in a wider application domain ranging from industry to biomedicine? The answer lies in image processing and computer vision. This course is a continuation of Digital Image Processing. In this course, the aim is to explore the field of computer vision and pattern recognition from an application perspective where the main focus will be on visual recognition and classification using deep neural networks. The students will learn and implement the state-of-the-art algorithms and techniques for gaining high-level understanding from images and videos. The course requires knowledge of linear algebra, probability and statistics along with the basics of image processing. The course contents are planned in a manner that enables students to undertake research projects.

EE/CE 453/352 Digital Signal Processing

Credit Hours: 3+1
Fulfils: EE Elective, CE Core, ECE Minor Elective
Prerequisite: EE 252 Signals and Systems

Introduction to digital signal representations in time and frequency domains; signal manipulations via filters and resampling; signal creation and capture and processing with real-time computing machinery.

EE 468 Mobile Robotics

Credit Hours: 3+0
Fulfils: EE Elective, CE Elective, ECE Minor Elective
Prerequisite: EE 354 Probability & Statistics or equivalent

Robotics is the science of perceiving and manipulating the physical world through computer-controlled mechanical devices. In the field of robotics, regardless of the nature of applications, we inherently deal with machines that move. Real world is not ideal or deterministic in nature; it is full of uncertainties, and exhibits a stochastic or random behavior. Thus, it is important to offer a course to make ECE students understand this challenging task of state estimation in engineering applications. In short, we would introduce the classic and state-of-the-art estimation results and probabilistic algorithms for estimating state of robots in linear/nonlinear systems corrupted by Gaussian/non-Gaussian measurement noise for localization and mapping applications

EE 441 Antennas and Wave Propagation

Credit Hours: 3+0
Fulfils: EE Elective, ECE Minor Elective
Prerequisite: EE 241 Electromagnetic Theory

The course is broadly divided into two major sections i.e., "Transmission Lines and Wave propagation" and "Antenna Theory". This course teaches the fundamentals of antenna and propagation and shows the application in practical examples. The course covers the theory of radiation, fundamental antenna parameters and concepts, wire antennas such as dipoles and loop antennas, antenna arrays, aperture antennas (e.g., horns), microstrip antennas, numerical analysis, communication & radar systems and propagation effects.

ENVS 301 Introduction to Environmental Engineering

Credit Hours: 3+0
Fulfils: EE IDEE. CE MDEE

Environmental problems represent one of the gravest global challenges of the 21st century. Engineering sustainable solutions to these environmental issues is one of our most pressing needs. In this course, students will learn fundamental science and engineering principles needed for environmental engineering. Students will apply these principles to problems such as water supply and treatment systems, sewage treatment of municipal and industrial wastewaters, stream and air pollution, and disposal of solid waste materials. In addition, this course will provide an overview of major themes in contemporary environmental engineering, including environmental impacts of socioeconomic changes, energy consumption and production, water supply and treatment, air pollution and global climate change.

ME 291 Computer Aided Engineering

Credit Hours: 3+0
Fulfils: EE IDEE, CE MDEE
Prerequisite: None

Fundamentals of Computer Aided Engineering (CAE) will be taught with the aim to equip students with modern design tools needed to effectively create, analyze, improve, and communicate their designs. The skills acquired will help students in their capstone projects and other future design projects. The course will be divided into three main portions: fundamentals of engineering drawing, mechanical analysis techniques to evaluate the performance of the designed product, and using a Computer Aided Design (CAD) program to design parts and assemble them into required assemblies while being cognizant of practical design considerations like manufacturability and ease of assembly. The course, being an engineering design course, will have a heavy "hands-on" tilt, whereby student performance will depend on the successful completion of various project-based design assignments. A major (end-of-semester) project will require students to design and analyze a practical contraption that satisfies functional and design requirements provided to them.

ME 302 Engineering Thermodynamics

Credit Hours: 3+0
Fulfils: EE IDEE, CE MDEE

The course deals with the aggregate thermodynamic properties of matter and extends it to principles which govern the design and functioning of energy convertors, thermodynamic cycles and heat pumps. A brief interlude into Statistical Thermodynamics would also be provided. This course will cover the fundamental aspects of classical thermodynamics with a focus on understanding the principles to design, implement and sustain a thermodynamic system. This course will also provide a rudimentary introduction to statistical mechanics to understand the connection between thermodynamics quantities and microscopic behavior of a many-particle system.

Professional Practice Elective Courses

ECON 302 Engineering Economics

Credit Hours: 3+0
Fulfils: Professional Practice

Topics include: Application of economic principles to engineering solutions, time value of money, cash flow analysis, quantization of profitability, methods of evaluating investments, comparison of alternative investments, inflation, depreciation, resource depletion, economic analysis of projects, economic management of engineering projects.

MGMT 304 Fundamentals of Intellectual Property

Credit Hours: 3+0
Fulfils: Professional Practice

Intellectual Property (IP) has grown from a narrowly specialized legal field into a major force in global social and economic life today. Topics include: managing technological transitions, intellectual property, creating and managing an innovative organization, managing research and development, organizational learning, economist and sociologist views of entrepreneurship, the process and management of entrepreneurship, the importance of innovation, teamwork, financial and marketing aspects, product quality; study will be supplemented with case studies.

MGMT 321 Engineering Project Management

Credit Hours: 3+0
Fulfils: Professional Practice

Topics include: fundamentals of Project Management, the processes, tools and techniques, modern tools, such as, MS Project, Agile (Scrum) applied to virtual project, soft skills, such as, Communication, leadership, team building, time management.

MGMT 322 Operations Management

Credit Hours: 3+0
Fulfils: Professional Practice

Topics include: concepts such as bottleneck measurement, process improvement and synchronization, process measurement, service improvement, six sigma approaches, lean management, statistical quality control techniques and decision trees. Therefore, this course will essentially help to inculcate skills to produce well rounded engineering professionals.

Computer Engineering

BS Computer Engineering

Faculty

Ahmad Usman	Assistant Professor and Program Director
Farhan Khan	Assistant Professor
Muhammad Farhan	Assistant Professor
Muhammad Umer Tariq	Assistant Professor
Munzir Zafar	Assistant Professor
Owais Talaat Waheed	Assistant Professor
Tariq Kamal	Assistant Professor
Saad Umer Baig	Lecturer
Areeba Aziz Rajput	Dean's Fellow

Vision

Be an agent of positive change in society through excellence in locally contextualized and globally competitive liberal-arts and discipline-specific education and research, and imparting an understanding of contemporary issues and challenges facing the society.

Program Description

The BS Computer Engineering degree is offered as part of the comprehensive Electrical and Computer Engineering (ECE) program, offering a robust and multidisciplinary curriculum that includes strong theoretical fundamentals and practical problem-solving. Today, electrical and computer engineering intersect from miniaturized integrated electronics to large-scale power plants. As a student, you will be exposed to a diverse set of exciting sub-disciplines such as:

- Artificial intelligence
- Biomedical devices
- Communications
- Computer architecture
- Control systems
- Digital and analog electronics
- Instrumentation
- Machine vision
- Networking
- Robotics
- Software development
- Wireless devices

The program is recognized for shaping students to be the next leading computer engineers to integrate in the creative world of evolving technological landscape.

The ECE program aims to offer electives in all possible areas of Computer Engineering. The following descriptions will provide information about the broader threads considered in the Computer Engineering curriculum. Students can choose to concentrate on one or more of these threads by appropriately choosing electives in these areas. These elective courses can be selected in consultation with their academic advisor.

Computing Systems Design

Invention of transistor and possibility of very large-scale integration (VLSI) has opened gateways for solving computing limitations of the world. Today, the smartphone in your pocket has more computing power than fastest supercomputers from 80s, and is smaller in size and less power hungry. This concentration aims to train students to design computing systems that are efficient in terms of speed, area, throughput, power and energy. Students work on various levels of design, including (but not limited to) devices, integrated circuit (IC) design, digital system design, computer architecture design, and high-performance computing. Perhaps, you'll be the person to design the next generation of Intel, AMD, or Apple computing chip.

Embedded Systems Design

In the form of desktop computers, laptops, tablets, and smart phones, most people are familiar with computers that process information for human consumption. However, the vast majority of computers in use, today, are much less visible. They run the engine, brakes, and airbags in a modern car; they let you control your household appliances, microwave, TV, etc.; they control robots on a factory floor, generators in a power plant, medical devices in a hospital, and traffic lights in a city. These less visible computers are called Embedded Systems. Compared to the general-purpose computing systems, the principal difference in designing and analyzing embedded systems stems from their interaction with physical processes in addition to human operators. Our Computer Engineering Program takes a systematic approach to embedded systems education through its focus on state-of-the-art modeling, design, implementation, and analysis tools for embedded systems.

Networks and Security

It is estimated that by 2025, we'll have an average of 9.27 connected devices per person in the world. This exponential increase in the number of connected devices has created new and interesting challenges for networks, including dealing with heterogeneous devices (varied availability of power and correspondingly varied computing capabilities of devices) over the network, especially in the Internet of Things (IoT); the increasing need for network security; the increasing demand for faster and reliable data transfer especially with inclusion of real-time devices such as tele-operated surgical robots on the network. The development of new standards as 5G and successful instances of network functions virtualizations are paving the way for addressing these challenges and creating a more seamlessly connected world. The Computer Engineering program at Habib University focuses on exposing you to foundational principles and networking, and current trends in networks and security.

Signal and Information Processing

Signal and Information Processing models and analyzes data representations of physical events. Signal and Information processing is at the heart of our modern world, powering today's entertainment and tomorrow's technology. You'll find it in your phones in form of compression when storing your audio and videos, when applying filters on your images or audio, or running analytics on those audio and video signals; in hospitals imaging our bodies; in autonomous vehicles making sense of environment so that vehicle can make safe decision; or behind technology used for speech recognition, detecting fraud, or stock market analysis in the form of Machine Learning algorithms. Signal and Information processing is the science behind our digital lives and this concentration will enable you to perhaps develop the next technology that enriches our everyday lives.

Software and Systems Engineering

The modern world is full of complex engineered systems that involve many component subsystems working in unison to deliver a useful service to consumers. These systems help us keep in touch with our friends and family, navigate the traffic of our city, access essential services such as electricity. With every passing day, computers and software are playing an increasingly import role in the successful implementation and operation of these complex engineered systems. When such systems fail, people get annoyed in the best case or seriously hurt and injured in the worst case. The fields of software engineering and systems engineering help us manage the complexity of these software-centric complex systems by providing a systematic approach to development and operation of these systems in a cost-effective and robust manner. Computer Engineering Program at Habib University incorporates software and systems engineering education to ensure that its graduates are equipped to lead the development and operation of the complex engineered systems of the modern world.

Program Educational Objectives

The Computer Engineering program at Habib University aims to produce competent computer engineers who:

1. Exhibit broad-based technical excellence in their engineering practice and in other professional dealings.
2. Are aware of the impact of their work on society and environment.
3. Are capable of leading through a pluralistic approach.
4. Engage in the lifelong process of independent and reflective learning.

Program Learning Outcomes

Following Program Learning Outcomes (PLO) are designed to prepare graduates to attain the program educational objectives and subsume the PLOs of Pakistan Engineering Council (PEC) and Accreditation Board for Engineering and Technology (ABET).

Computer engineering program at Habib University aims to produce engineers who, at the time of graduation, have

1. **Engineering Knowledge**: an ability to apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems;

2. **Problem Analysis**: an ability to identify, formulate, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering;

3. **Design of Solutions**: an ability to design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations;

4. **Investigation**: an ability to investigate complex engineering problems in a methodical way including literature survey, design and conduct of experiments, analysis and interpretation of experimental data, and synthesis of information to derive valid conclusions;

5. **Modern Tool Usage**: an ability to create, select and apply appropriate techniques, resources, and modern engineering tools, including prediction and modelling, to complex engineering activities with an understanding of the limitations;

6. **Contextual Awareness**: an ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solution to complex engineering problems;

7. **Environment and Sustainability**: an ability to understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate knowledge of and need for sustainable development;

8. **Ethics**: ability to apply ethical principles and commit to professional ethics, responsibilities, and norms of engineering practice;

9. **Collaboratio**n: an ability to work effectively, as an individual or in a team, on multifaceted and/or multidisciplinary settings;

10. **Communication**: an ability to communicate effectively, orally as well as in writing, on complex engineering activities with the engineering community and with society at large;

11. **Project Management**: an ability to demonstrate management skills as a member and/or leader in a team, to manage projects in a multidisciplinary environment;

12. **Lifelong Learning**: an ability to recognize importance of, and pursue lifelong learning in the broader context of innovation and technological developments.

Requirements for the Computer Engineering Major – Class Of 2026

All students majoring in *Computer Engineering* are required to complete a minimum of 36 courses and a minimum of 134 credit hours of coursework, and achieve a minimum CGPA of 2.33. The courses are divided in the following categories:

University Requirements

All students are required to take 10 courses spanning seven forms of thought and action, called the Habib Liberal Core. Some courses in the major can also be counted towards meeting requirement of certain forms of thought in the core. For more details, please see the section on Habib Liberal Core in the catalog.

Engineering Sciences

These courses in Mathematics, Physics, or other Natural Sciences provide the foundations for future Computer Engineering courses as well as expand multidisciplinary breadth of students. Some of these courses can be counted towards minors in Mathematics, Physics, or other natural sciences.

Computer Engineering Foundation

These are foundational courses in both Electrical Engineering and Computer Science. The Computer Science courses lay the basis for understanding the theory of computation and software, while the Electrical Engineering courses cover the methods and tools of analysis required to understand and design hardware of computing systems.

Computer Engineering Core

The core courses introduce the students to the different sub-disciplines in Computer Engineering. These include courses in design of computing systems, embedded systems, networks, software design, systems resource management, signal processing, and algorithms. The electives enable Computer Engineering majors to acquire in-depth knowledge of their discipline. Students are required to take four electives in this category. These electives could be in the areas of Computer Architecture, Computing Systems Design, Embedded Systems, Software and Systems Engineering, Networks, Security, Signal Processing, Machine Learning, or Robotics. Additionally, the Computer Engineering seminar is offered in students' junior year to expose them to a diverse set of sub-disciplines within CE.

Design in Engineering

This set of courses on equipping students with design tools necessary to be a designer of effective solutions. Students will receive training on design processes, practice human-centered design, explore systems thinking to construct a big picture of complex systems, and apply these ideas on real-world systems and problems in communities.

Other Requirements

The interdisciplinary nature of engineering problems today require that Computer Engineers are aware of and can work together with engineers from other disciplines. So, students are also required to take courses in engineering disciplines other than CE, such as Electrical, Computer Science, Mechanical, Civil, Aerospace, Environmental, to expand their knowledge base across disciplines and courses for their professional development, in disciplines including but not limited to Economics, Management, Entrepreneurship.

Requirements for the Computer Engineering Major (Class of 2026)

Course Category	Courses	Min. No. of Courses	Min. Credit Hours
University Requirements	Habib Liberal Core*	10*	32*
Natural Science & Math Requirement	MATH 101 Calculus I	01	4+0
	MATH 102 Calculus II	01	3+0
	MATH 205 Linear Algebra	01	3+0
	CE 361 Introduction to Probability & Statistics	01*	3+0*
	CE 362 Statistics & Inferencing	01	3+0
	Natural Science Elective	01	3+0
Computing Requirement	CS 101 Programming Fundamentals	01*	2+1*
	CS 113 Discrete Mathematics	01	3+0
	CE 171 Data Structures and Algorithms	01	3+1
	CE 272 Object Oriented Programming and Design Methodologies	01	3+1
	CE 324 Operating Systems	01	3+1
	CS 373 Databases	01	3+1
	CE 374 Software Engineering	01	3+0
Engineering Requirements	**Computer Engineering Foundation**		
	CE 100 Intro to Electrical & Computer Engineering	01	0+2
	CE 112 Electric Circuits I	01	2+0
	Computing Systems Design		
	CE 222 Digital Logic Design	01	3+1
	CE 321 Computer Architecture	01	3+1

Course Category	Courses	Min. No. of Courses	Min. Credit Hours
	CE 332 Microcontrollers & Interfacing	01	0+1
	CE 325 Digital Systems Design	01	3+0
	Electronics		
	CE 211 Basic Electronics	01	3+1
	Information Systems		
	CE 251 Signals & Systems	01	3+1
	CE 352 Digital Signal Processing	01	3+1
	Networking & Security		
	CE 341 Data Communication & Networking	01	3+1
	Design		
	PLAY 113 Design Your HU Experience	01	0+1
	ENGR 291 Engineering Workshop & Design	01	0+1
	EE 391 Engineering Design & Innovation	01*	0+2*
Engineering Electives	Computer Engineering Electives	04	12^
	Multidisciplinary Engineering Electives	02	6+0
Capstone Design Project	CE 491 Capstone Design Project I	01	0+3
	CE 492 Capstone Design Project II	01	0+3
Other Requirements	CE 301 Electrical & Computer Engineering Seminar	01	1+0
	Professional Practice Electives	02	5+0
	Overall	44	134

* Courses may overlap leading to a different total number of courses and credit hours.
^ Four Computer Engineering elective courses of 3 or 4 credit hours each. All electives are to be taken with their accompanying labs

Electrical & Computer Engineering Minor

All Habib University Students choosing to pursue ECE minor must complete a minimum of seven courses totaling at least 22 credits. Requirements of the minor can be found in the 'Minors' section of the Course Catalog.

Course Descriptions

Required Courses

CE 100/EE 100 Introduction to Electrical & Computer Engineering

Credit Hours: 0+2
Fulfils: EE foundation, CE foundation, ECE Minor foundation
Corequisite: CS 101 Programming Fundamentals

Through a series of projects, this course aims to expose the students, having little or no prior exposure, to the fascinating world of electrical and computer engineering. The course will allow the students to gain an appreciation for the history and possible futures of various disciplines within electrical and computer engineering. Students will spend most of their time in the lab working on these projects with classroom instruction for support. The course will introduce basic electrical concepts including charge, voltage, current, energy, power, resistance, capacitance, inductance, and Kirchoff's laws. Practical digital and analog electronic systems will also be introduced to illustrate advanced topics that are treated completely in subsequent electrical engineering courses.

CE 112/EE 112 Electric Circuits I

Credit Hours: 3+1
Fulfils: EE Foundation, CE Foundation, ECE Minor Foundation
Prerequisite: None

This course introduces basic DC and AC steady-state analysis for linear circuits. Topics discussed in this course include circuit elements, Ohm's law and Kirchhoff's laws, node and mesh analysis, energy storage elements, Thevenin and Norton theorems, Phasors and sinusoidal steady state analysis. Computer applications in circuit simulation and numerical solution is also discussed.

CE 171 Data Structures and Algorithms

Credit Hours: 3+1
Fulfils: Computing
Prerequisite: None

Motivates the design of algorithms by exploring various algorithms for a single task: linear search and binary search, bubble sort, insertion sort, selection sort, merge sort, quick sort; introduces techniques to reason about and compare algorithms: asymptotic analysis and notation, Master theorem; introduces frequently used data structures: list, tree, graph, stack, queue; discusses and analyzes basic operations on the data structures: infix, postfix, and prefix traversal, breadth-first and depth-first search, computation of graph. (Cross listed with CS 102)

CE 211/EE 211 Basic Electronics

Credit Hours: 3+1
Fulfils: EE Core, CE Foundation, ECE Minor Concentration Foundation
Prerequisite: EE 112/CE 112 Electric Circuits I

The course aims to introduce students to semiconductor devices, with emphasis on application of these devices in realizing analog and digital electronic circuits. The course starts with an introduction to semiconductors, energy bands, valence bonds, doping, n-type and p-type semi-conductors. The electronic devices, such as PN junction diode, bipolar junction transistor (BJT) and Metal-oxide semiconductor field-effect transistor (MOSFET), along with their applications are discussed in detail. Biasing circuits, single transistor amplifiers and their frequency are also discussed. Circuit simulations using PSpice (OrCAD) forms an important bridge between the theory discussed in class and lab experiments.

CE 222/EE 172 Digital Logic and Design

Credit Hours: 3+1
Fulfils: EE Core, CE Core, ECE Minor Concentration Foundation
Prerequisite: None

Introduction to the design of digital hardware, realization of computation with logic gates; Boolean algebra, design of combinational logic circuits, and analysis and design of clocked sequential logic circuits, circuits for arithmetic operations; introduction to hardware description language and its application to logic design. *(Cross-listed with CS 130.)*

CE 251/EE 252 Signals and Systems

Credits Hours: 3+1
Fulfils: EE Foundation, CE Core, ECE Minor Concentration Foundation
Prerequisite: MATH 101 Calculus I

The topics covered in this course include types of signals; unit impulse and unit step functions; linear time invariant (LTI) systems and their properties; convolution sum and convolution integral; Fourier series, Fourier, Laplace and Z transforms; analysis and characterization of LTI systems using various transforms, Sampling.

CE 272 Object Oriented Programming

Credit Hours: 3+1
Fulfils: Computing

Introduces object oriented and related memory concepts; motivates C++ as the language of choice; topics include: pointers and structs, objects, heap allocation, data encapsulation, classes, namespaces, constructors and destructors, virtual functions and destructors, operator overloading and standard input/output, inheritance and polymorphism, templates, standard library containers, and software design using UML 2.0. (Cross listed with CS 224)

CE 301/EE 301 Electrical & Computer Engineering Seminar

Credit Hours: 1+0
Fulfils: EE Core, CE Core

Through a series of weekly seminars by researchers and engineers working in the domain of Electrical Engineering, this course achieves the following objectives:

Exposure to various sub-disciplines in Electrical Engineering, their corresponding electives at HU, and that state of research in that sub-discipline;

Strengthen the commitment to professional and ethical practice of engineering;

Awareness of some theoretical ideas in Electrical Engineering, not covered in other courses.

CE 321/ EE 371 Computer Architecture

Credit Hours: 3+0
Fulfils: EE Core, CE Core, ECE Minor Elective
Prerequisite: EE 172 /CE 222 Digital Logic and Design

Studies the architecture of processors that enable general purpose computing and develops hands-on expertise in developing complex logical components. Topics include instruction set architecture, addressing modes, processor design and computer arithmetic, pipelining, memory systems, fetch execution cycle, processor implementation on FPGA using Verilog HDL.

CE 324: Operating Systems

Credit Hours: 3+1
Fulfils: CE Computing Systems

The student will be taught principles of modern operating systems. In particular, the course will cover details of concurrent processes, multi-threads, CPU scheduling, memory management, file system, storage subsystem, and input/output management. This will be accomplished by integrating theory and practice through coordinated lecture and lab hours.

CE 325: Digital Systems Design

Credit Hours: 3+0
Fulfils: CE Computing Systems
This course is currently under development.

CE 332/ EE 376 Microcontrollers and Interfacing

Credit Hours: 0+1
Fulfils: EE Core, CE Core, ECE Minor Elective
Prerequisite: EE 172 /CE 222 Digital Logic and Design

Microcontrollers play a central role in modern life, controlling everything from the engine of a car, to domestic and office machinery. Microcontroller fundamentals including architecture, assembly language programming, and interfacing. Applications of industry-standard microcontrollers in

embedded systems. Employs software design tools, simulators, and hardware trainers. Will focus on interfacing the ARM RISC processor to motors, actuators and sensors.

CE 341/ EE 424 Data Communication & Networking

Credit Hours: 3+1
Fulfils: EE Elective, CE Core, ECE Minor Elective
Prerequisite: None

It is the first course on networking therefore no prior background is expected. This course will not only introduce students to the basics of the communication of data in the networks of computer but will also enable to develop some insight towards the core issues related to the communication models and different network devices.

CE 352/EE 453 Digital Signal Processing

Credit Hours: 3+1
Fulfils: EE Elective, CE Core, ECE Minor Elective
Prerequisite: CE 251/EE 252 Signals and Systems

Introduction to digital signal representations in time and frequency domains; signal manipulations via filters and resampling; signal creation and capture and processing with real-time computing machinery.

CE 361/ EE 354 Introduction to Probability and Statistics

Credit Hours: 3
Fulfils: EE Foundation, CE Core
Prerequisite: MATH 102 Calculus II

Set theory and counting principles, axiomatic definition of probability, independence and conditional probability, Bayes' theorem; random variables (RVs) and their cumulative distribution function, probability mass functions, probability density functions and moments; joint RVs; limits theorems; statistics; applications. *(Cross listed with MATH 310)*

CE 362/EE 355/MATH 322: Statistics and Inferencing

Credit Hours: 3+0

Fulfils: CE Natural Science & Math

Introduces probabilistic modelling for problems of inference and machine learning from data, emphasizing analytical and computational aspects. Distributions, marginalization, conditioning, and structure, including graphical and neural network representations. Belief propagation, decision-making, classification, estimation, and prediction. Sampling methods and analysis. Introduces asymptotic analysis and information measures. Computer simulation-based computational component explores the concepts introduced in class in the context of contemporary applications. Students design inference algorithms, investigate their behavior on real data, and discuss experimental results.

CE 373: Database Systems

Credit Hours: 3+1
Fulfils: CE Algorithms and Software

Explores in detail the theoretical and practical aspects of Relational Database Management Systems (RDBMS); develops an understanding of database modeling, relational algebra, structured query language (SQL), components of Database Management System (DBMS), transaction management and concurrency control, database fine-tuning via indexing and partitioning, and database connectivity with front-end applications; discusses administrative aspects of database systems including database security, database management vs data warehousing vs data mining, and big data and its challenges.

CE 374: Software Engineering

Credit Hours: 3+0
Fulfils: CE Algorithms and Software

Approaches software engineering as the study and practice of a collection of concepts, techniques and tools which enable programmers to design, build, and maintain large software systems in a reliable and cost effective way; develops skills and understanding that function as the basis for many of the more advanced analysis and design practices encountered in the industry; topics include: systems development process, stakeholders and their roles, systems development project needs, software process methodologies, spiral and RUP, software analysis and requirement discovery, data modelling, SAD and OOAD, UML, use case diagrams, software project management, project scope, network diagrams and CPM, agile methodologies, XP, Scrum and FDD, class diagrams, realization of use cases, object-oriented design, sequence diagrams, activity diagrams, state transition diagrams, user interface design, software testing, software construction and maintenance.

CE 391/EE 391 Engineering Design and Innovation

Credit Hours: 0+2
Fulfils: EE Design, CE Design

This course aims to cultivate skills needed to produce great designs, be a more effective engineer, and communicate with high emotional and intellectual impact. This is accomplished by working on projects centered around a locally contextualized wicked problem and students are expected to develop a solution to their identified problem by the end of semester. During the course of the semester, students will study and apply techniques suited for various steps of the design process. Students will come to appreciate that a design problem involves multiple stakeholders, come to terms with the ambiguity that shows up in design problems, make decisions in presence of multiple conflicting objectives and constraints, handle uncertainty, think as part of a team, learn how to manage the progress of their project, and communicate their design effectively.

CE 491/EE 491 Capstone Project I

Credit Hours: 0+3
Fulfils: Design in Engineering, Design Project
Prerequisite: ENGR 291 Engineering Workshop, CE 333/EE 376, EE/CE 391 Engineering Design & Innovation, Approval from respective capstone committee

By the senior year, students have acquired sufficient breadth in Electrical Engineering (EE) and are on their way to acquire depth in one or more areas of specialization through technical electives. Intellectual maturity also requires that students understand their education in the broader context of the world and are prepared to make committed choices as participants of this complex world. The capstone design project, offered as a two semesters sequence, provides students with an opportunity to reflect on their entire educational experience, integrate the knowledge and skills acquired in earlier years, form connections within and across disciplines, and synthesize a solution to a problem connecting them to the broader issues of their discipline as well as the world they're about to enter.

CE 492/EE 492 Capstone Project II

Credit Hours: 0+3
Fulfils: Design in Engineering, Design Project
Prerequisite: EE 491/CE 491 Capstone Project I

This year-long sequence represents the culmination of study towards the BS degree. Students work individually or in small teams on a project in which they utilize the knowledge acquired during the first three years of education. Each project is closely supervised by a faculty member and each team produces a comprehensive report at the end of the project.

ENGR 291 Engineering Workshop

Credit Hours: 0+1
Fulfils: EE Design, CE Design, ECE Minor Foundation
Prerequisite: None

This course aims to introduce students to hands-on engineering skills, necessary for creating their own prototypes. Topics covered in this course include introduction to engineering design process, shop safety, engineering drawing, solid modeling (CAD), 3D printing, effective use of basic hand tools such as saws and files, machining (Lathe, Milling, Drill press), CNC machining, soldering techniques, and PCB design and printing. The course work emphasizes practical skills through lab activities and project. Students will be required to work with different materials including metal, wood, and plastic.

Engineering Elective Courses

EE 365 Industrial Instrumentation & Measurements

Credit Hours: 3+1
Fulfils: EE Elective, CE MDEE, ECE Minor Elective

In this course, students will learn measurement techniques applied to instruments used both in laboratory and industry with more focus on fundamentals principles which are key to modern day instrumentation. This course will introduce the function, operation, and application of common electrical/electronic instruments, measurement principles, and statistical analysis. Students will investigate the fundamental limitations of data acquisition systems and recognize and predict aliasing and quantization errors associated with the digital representation of analog signals

EE 366/CE 366 Introduction to Robotics

Credit Hours: 3+1
Fulfils: EE Elective, CE Elective, ECE Minor Elective
Prerequisite: MATH 205 Linear Algebra

Robotics is a multi-disciplinary area involving ideas from mechanical engineering, electrical and computer engineering, and computer science. This course is a breadth-first course designed to be the first course in the series of robotics courses. The goal of the course is to acclimatize the students with the area of robotics and to get them started on building robots. Topics covered include: forward and inverse kinematics, velocity kinematics, singularities, trajectory generation, actuation mechanisms, robot vision, feedback control, motion planning, control architectures, perception, localization, and locomotion.

EE 422 Wireless and Mobile Communication

Credit Hours: 3
Fulfils: EE Elective, ECE Minor Elective
Prerequisite: EE 322 Analog & Digital Communication

This course aims to introduce wireless communication to EE students. The route to this introduction is through the concepts of the most pervasive wireless communication system - Cellular Mobile Networks. The course comprises of wireless communications basics, systems standards, architecture and topologies. The course includes cellular concepts, traffic engineering, radio waves propagation, study of different propagation Models and coverage analysis under different types of channel models, fading and Multipath scenarios.

EE 427 Cellular Internet of Things in 5G

Credit Hours: 3+1
Fulfils: EE Elective, CE Elective, ECE Minor Elective

This course is designed to introduce and deepen student's understanding on the essentials of Internet of Things (IoT) Devices communicating with and without being attached to the cellular Networks, specifically with the Fifth Generation (5G) Cellular Networks. Moreover, dealing with IoT devices as the terminals, would expose students to the entire stack of protocols i.e from Physical to the Application layer. The course is aimed to inculcate a deep understanding about the Cellular Internet of things (IoT) Networks, lay the foundation of Machine Type Communications (MTC) by framing different IoT scenarios and expose students to evolution of MTC into a massive MTC use case for 5G.

EE 432 Power Electronics

Credit Hours: 3+1
Fulfils: EE Elective, ECE Minor Elective
Prerequisite: EE 211 Basic Electronics

This course aims to familiarize students with the power semiconductor devices (power diodes and transistors), their construction, electrical characteristics, operating-principle, and their various industrial and commercial applications. Along with good mathematical skills, students must be familiar with the fundamental understanding of electronic components; for instance, an inductor and a capacitor. The topics covered in the course are: Power Semiconductor Devices; AC to DC Converters (Uncontrolled Rectifiers); AC to DC Converters (Controlled Rectifiers); AC to AC Converters; DC to DC Converters; DC to AC Converters (Inverters).

EE 433 Power Electronics – System Design

Credit Hours: 3+0
Fulfils: EE Elective, ECE Minor Elective

Power electronics is widely used in automotive, industrial and renewable energy applications; for instance, electrical vehicles, uninterruptible power supplies, and fuel-cell application. High-efficiency, low cost, and small size are some of the important design goals for any converter design; however, they of course need to comply with the electromagnetic interference (EMI) requirements. High efficiency in power converters can only be achieved by means of optimized converter design (specially the magnetic components) which then further calls for a well-engineered EMI filters. This course is mainly divided in to two parts. The first part deals with the basic circuit operations of various well-known power converters, and their analysis and design. Next, EMI noise issues in power converters will be treated in extensive details. EMI noise models for isolated power converters will be established and analyzed to build optimized EMI filters.

EE 451 Digital Image Processing

Credit Hours: 3+1
Fulfils: EE Elective, CE Elective, ECE Minor Elective
Prerequisite: CS 224 Object Oriented Programming

This course is developed for EE, CE, and CS students to introduce them the fundamental concepts, principles and techniques of digital image processing and their applications to solve real world problems. After completing the course students will be familiar with the key components of image processing system starting from image acquisition to image enhancement and restoration to morphological processing and segmentation till image representation, description and object classification. The course offers great opportunities in Final Year Projects

EE 452 Computer Vision

Credit Hours: 3+0
Fulfils: EE Elective, CE Elective, ECE Minor Elective
Prerequisite: EE 451 Digital Image Processing, MATH 205 Linear Algebra

Have you ever wondered how a machine or computer is made capable of understanding, interpreting and giving semantics to an image/video? Have you ever thought how image/video could be used to automate processes in a wider application domain ranging from industry to biomedicine? The answer lies in image processing and computer vision. This course is a continuation of Digital Image Processing. In this course, the aim is to explore the field of computer vision and pattern recognition from an application perspective where the main focus will be on visual recognition and classification using deep neural networks. The students will learn and implement the state-of-the-art algorithms and techniques for gaining high-level understanding from images and videos. The course requires knowledge of linear algebra, probability and statistics along with the basics of image processing. The course contents are planned in a manner that enables students to undertake research projects.

EE 468 Mobile Robotics

Credit Hours: 3+0
Fulfils: EE Elective, CE Elective, ECE Minor Elective
Prerequisite: EE 354 Probability & Statistics or equivalent

Robotics is the science of perceiving and manipulating the physical world through computer-controlled mechanical devices. In the field of robotics, regardless of the nature of applications, we inherently deal with machines that move. Real world is not ideal or deterministic in nature; it is full of uncertainties, and exhibits a stochastic or random behavior. Thus, it is important to offer a course to make ECE students understand this challenging task of state estimation in engineering applications. In short, we would introduce the classic and state-of-the-art estimation results and probabilistic algorithms for estimating state of robots in linear/nonlinear systems corrupted by Gaussian/non-Gaussian measurement noise for localization and mapping applications

EE 441 Antennas and Wave Propagation

Credit Hours: 3+0
Fulfils: EE Elective, ECE Minor Elective
Prerequisite: EE 241 Electromagnetic Theory

The course is broadly divided into two major sections i.e., "Transmission Lines and Wave propagation" and "Antenna Theory". This course teaches the fundamentals of antenna and propagation and shows the application in practical examples. The course covers the theory of radiation, fundamental antenna parameters and concepts, wire antennas such as dipoles and loop antennas, antenna arrays, aperture antennas (e.g. horns), microstrip antennas, numerical analysis, communication & radar systems and propagation effects.

ENVS 301 Introduction to Environmental Engineering

Credit Hours: 3+0
Fulfils: EE IDEE. CE MDEE

Environmental problems represent one of the gravest global challenges of the 21st century. Engineering sustainable solutions to these environmental issues is one of our most pressing needs. In this course, students will learn fundamental science and engineering principles needed for environmental engineering. Students will apply these principles to problems such as water supply and treatment systems, sewage treatment of municipal and industrial wastewaters, stream and air pollution, and disposal of solid waste materials. In addition, this course will provide an overview of major themes in contemporary environmental engineering, including environmental impacts of socioeconomic changes, energy consumption and production, water supply and treatment, air pollution and global climate change.

ME 291 Computer Aided Engineering

Credit Hours: 3+0
Fulfils: EE IDEE, CE MDEE
Prerequisite: None

Fundamentals of Computer Aided Engineering (CAE) will be taught with the aim to equip students with modern design tools needed to effectively create, analyze, improve, and communicate their designs. The skills acquired will help students in their capstone projects and other future design projects. The course will be divided into three main portions: fundamentals of engineering drawing, mechanical analysis techniques to evaluate the performance of the designed product, and using a Computer Aided Design (CAD) program to design parts and assemble them into required assemblies while being cognizant of practical design considerations like manufacturability and ease of assembly. The course, being an engineering design course, will have a heavy "hands-on" tilt, whereby student performance will depend on the successful completion of various project-based design assignments. A major (end-of-semester) project will require students to design and analyze a practical contraption that satisfies functional and design requirements provided to them.

ME 302 Engineering Thermodynamics

Credit Hours: 3+0
Fulfils: EE IDEE, CE MDEE

The course deals with the aggregate thermodynamic properties of matter and extends it to principles which govern the design and functioning of energy convertors, thermodynamic cycles and heat pumps. A brief interlude into Statistical Thermodynamics would also be provided. This course will cover the fundamental aspects of classical thermodynamics with a focus on understanding the principles to design, implement and sustain a thermodynamic system. This course will also provide a rudimentary introduction to statistical mechanics to understand the connection between thermodynamics quantities and microscopic behavior of a many-particle system.

Professional Practice Elective Courses

ECON 302 Engineering Economics

Credit Hours: 3+0
Fulfils: Professional Practice
Prerequisite: None

Topics include: Application of economic principles to engineering solutions, time value of money, cash flow analysis, quantization of profitability, methods of evaluating investments, comparison of alternative investments, inflation, depreciation, resource depletion, economic analysis of projects, economic management of engineering projects.

MGMT 321 Engineering Project Management

Credit Hours: 3+0
Fulfils: Professional Practice
Prerequisite: None

Topics include: fundamentals of Project Management, the processes, tools and techniques, modern tools, such as, MS Project, Agile (Scrum) applied to virtual project, soft skills, such as, Communication, leadership, team building, time management.

MGMT 322 Operations Management

Credit Hours: 3+0
Fulfils: Professional Practice
Prerequisite: None

Topics include: concepts such as bottleneck measurement, process improvement and synchronization, process measurement, service improvement, six sigma approaches, lean management, statistical quality control techniques and decision trees. Therefore, this course will essentially help to inculcate skills to produce well rounded engineering professionals.

Integrated Sciences and Mathematics

Faculty

Humaira Qureshi	Assistant Professor and Program Director
Anzar Khaliq	Associate Professor
Sameena Shahzaman	Associate Professor
Aeyaz Jamil Keyani	Assistant Professor
Hassaan Furqan Khan	Assistant Professor
Humaira Jamshed	Assistant Professor
Rameez Raghib	Lecturer
Sajal Sohail Rana	Lecturer
Aatyka Fatima	Dean's Fellow

Vision

Integrated Sciences and Mathematics (ISciM) at Habib University offers a diverse range of rigorous foundational and research-based courses that allow students from all disciplines to broaden their understanding of natural science and mathematics. Our interdisciplinary offerings profiting from various forms of design and community-based projects allow students to develop essential hard and soft skills required to understand and address complex problems. Key thrust areas for the program include Energy, Environment, Climate Change, Infectious Diseases, Global Health, Theoretical Physics and Applied Mathematics. The program currently offers two academic minors in Physics and Mathematics.

Department Goals

Through ISciM, based on their course selection, the graduating Habib students will:

1. Understand the foundations and the applications of the scientific method
2. Understand the fundamentals of energy, environment, and global warming and learn key skills to address issues of present times
3. Develop experimental skills in physics, chemistry, and biology; develop a strong foundation in physics, chemistry, bio-sciences, environmental science, energy, and mathematics
4. Understand the human body functions at cellular and molecular level and the effects of nutrition, microorganisms and environment on human health and society
5. Develop strong skills in data analysis with an ability to use various software tools
6. Develop a strong grasp on scientific writing
7. Develop the ability to understand current research in various fields of science

Minors Offered by the ISciM Program

Minors Offered by the Comparative Humanities Program

S. No	Minors	Offered by	Offering School	No. of Courses	No. of Credit Hours
1	Biosciences			05	17
2	Physics	ISciM	DSSE	07*	20
3	Mathematics			07	20

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

Requirements of the minors can be found in the 'Minors' section of the Course Catalog.

Course Descriptions

Natural Sciences

AST 101 Astronomy: The Universe Around Us

Credit Hours: 3
Fulfils: Free elective and Physics Minor
Prerequisites: None

Purpose of this course is to provide an introduction to scientific method in action, as exemplified by developments in Astronomy, and create a global perspective about the physical universe we live in. In this sense, this course fulfills a crucial need of a liberal arts and science curriculum by providing a cross-disciplinary, holistic understanding of our modern scientific outlook of the physical world.

BIO 101 Cell Biology & Public Health

Credit Hours: 3+1
Fulfils: Natural Science Requirement
Prerequisite: None

This course provides an introduction to cellular and molecular biology and builds its connection with human biological processes; there will be a prime focus on developing skills to communicate biological concepts to laymen. Topics include: Prokaryotic and eukaryotic cells, structure and function of cellular organelles, cells tissues and organ systems, movement across cell membranes, cellular reproduction, DNA replication, transcription and translation, Mendelian genetics, blood groups, introduction to the immune system and vaccines, dengue viral infection, and cancer development. Workshops on communication design in public health will be integrated

BIO 102 The Secret World of Microbes

Credit Hours: 3+1
Fulfils: Natural Science requirement
Prerequisites: None

This course explores the vast realm of tiny, clever little beings that are present everywhere but are easily ignored as they are not visible to the naked eye. Microbes are microscopic living organisms that were the first to colonize earth. They are present everywhere; in the soil, air, water, food, even on our bodies. In fact, you can find more microbes on your hand than there are people on the entire planet. Albeit tiny, their role is so much more important. Without them, we couldn't digest our food, garbage wouldn't decay, our ecosystems would collapse. Even NASA has a team researching on the microbial life that can survive in space. Understanding microbes is essential to understanding the past and the future of ourselves and our planet. The reason bacteria serve as a valuable model system is because: a) they are easy and relatively cheaper to maintain, b) they take just 20-30 minutes to divide so generations can be studied in a short amount of time and c) they possess simpler biological systems reflective of complex organisms.

The lab component of this course is meant to be easy and fun! Discover how many microbes reside on your cell phone, laptop, bean bags of student lounge, or in the cafeteria food! Test which hand sanitizer or detergent works best, or who provides the most hygienic '*gola ganda*' (ice candy) in town!

BIO 102+BIO 104L Introduction to Ecology and Evolutionary Biology

Credit Hours: 3+1
Fulfills: It fulfills Natural Science requirement for SSE students.
Prerequisites: None

Understanding how nature functions is necessary in order to develop environmental protection, conservation and resource management policies that work. The goal of this course is to familiarize students to ecological and evolutionary concepts that govern natural systems, so that they are able to make informed decisions on pressing social issues in Pakistan, such as global climate change, conservation of biodiversity, human population growth and resource management. This course is divided into two sections: 1) Evolution and Adaptation, and 2) Ecology and Biodiversity. Each lecture (3 hours) will be accompanied by a laboratory session (3 hour) where students will discuss and explore the concepts learned during lecture.

BIO 111 Food and Nutrition

Credit Hours: 3+1
Fulfils: Natural Science Requirement
Prerequisite: None

The course covers a wide range of knowledge from the basics of nutritional science to the use of food for preservation and management of health. It provides an overview of the social and cultural shifts in food consumption that contributed to the modern epidemics of chronic conditions such as obesity, diabetes and cardio metabolic disorders.

The overarching aims of this elective course are following:
- Provides an introduction to food sciences and nutrition research
- Evoke global thinking and international mindedness
- Critique on how you know what you know
- Experience the scientific method in action: Observe/Explore, Re-search, Conclude, Repeat
- Instill life-long learning

BIO 121 Introduction to Biochemistry

Credit Hours: 3+1
Fulfils: Natural Science Elective
Prerequisite: None

Biochemistry is the study of life. This fascinating natural science will provide insights into the chemical processes driving the biological systems. This course will immerse you in the sub-cellular world to understand the processes that are integral for life. You will develop an appreciation of the

basic principles of biochemistry and workings of the biological networks. Since the field of biochemistry is continually evolving, through this course you will be introduced to the biochemistry underlying some concepts such as molecular biology, genetics, evolutionary biology, plant biology, human physiology and the current advancements in the field of medicine. You will develop problem solving, critical thinking and analytical skills. The class and lab sessions will embrace variable teaching and learning strategies for audio and visual learners, including but not limited to flip classes, discussions, think-pair-share, activities, and video sessions, etc. Lab will include a combination of wet lab and virtual lab where the topics would range from detection and analysis of macromolecules, to isolating DNA from cells, testing blood sugars, and optimizing enzyme catalyzed reactions etc.

BIO 151 Bioscience in Cinema: Myths and Reality

Credit Hours: 3
Fulfils: Natural Science Elective, Free elective, Cross-listed with CND fulfills the 100-level-elective course requirement of the bioscience minor
Prerequisite: None

"Science helps us solve problems, and art helps us cope with the problems. This is good because science often takes a long time to solve, and in the meantime, we have to cope." David Zinn

So tell me, are you interested in the art of movies? Are you interested in the science of life? Perhaps both of them. This course intends to mitigate the dichotomy between the two fields and offers an integrated experience. The underlying theme of the course is to comprehend a variety of biological concepts via a popular medium of creative expression, in this case selected films on scientific topics. The course will provide insights into a myriad of biological processes governing our world. You will appreciate the power of movies in developing an understanding of various biological phenomena. The central focus will be on the following themes: 1) Infections, 2) Human/animal experimentation and ethics, and 3) Plant biology. Within these themes, you will learn about the scientific method, evolution and survival of the fittest, ecological sustainability, genetic engineering, disease infections and immunity, plant's defense mechanisms, plants communication, exobiology and much more. While inspecting the subject matter in these films, you will develop critical thinking and analytical reasoning, which will help develop a deeper understanding and appreciation of the world around you. You will learn to express your thoughts through blogs and vlogs, and to communicate efficiently in written and verbal discussions.

BIO/LIT 201 Digitally Yours Visual Novels About Diseases

Credit Hours: 3
Fulfils: Natural Science Requirement
Prerequisite: None

This interdisciplinary course explores digital narrative techniques focusing on key areas of disease/cell biology and empathy through storytelling. It examines the relationship between the afflicted and the caregivers, the reader and the sufferer through a mix of bio scientific knowledge and creative writing. The bio component of the course focuses on molecular and cellular functions during infectious and non-infectious diseases of contextual relevance. The course reconnoiters the rhetoric

of empathy and the elucidations of science and art through the modern technology of Augmented Reality and Ren'Py (visual novels) and how that has changed our perceptions in a global, connected world.

BIO 211 Understanding the Human Body- The Physiology of Everyday Life

Credit Hours: 4
Fulfils: Natural Science Elective
Prerequisite: None

In this course you will learn how we use our body every day to respond to an ever-changing environment, and the fascinating ways we deal with physical, emotional, and biological threats. You will understand how our heart and vessels work together to circulate the blood, all the amazing things our blood is capable of doing (from maintaining homeostasis to fighting infection), how our brain and nerves protect us, and how hormones ensure proper growth, development, and repair. You will explore our role in some of the common health problems afflicting mankind today, and develop a systematic, integrated understanding of how the body functions.

In the labs part, you will see these systems in action, and apply the concepts first hand by measuring blood pressure and heart rate, and relating it to exercise physiology. You will examine the blood composition and blood types, witness the microbes on and around you and test them against antibiotics, gather and interpret data on sleep quality, anxiety levels, eating behaviors, and traits such as focus, flexibility, and adaptability.

This course is for a diverse student pool and will be particularly interesting for individuals who are intrigued by the human body. There are no prerequisites and students with a non-biology background will equally enjoy the experience.

BTEC 101 Introduction to Biotechnology

Credit Hours: 3
Fulfils: Natural Science Requirement
Prerequisite: None

The last century has seen the development of an impressive range of new biotechnologies, largely from our ability to harness the power biology at the molecular, and even sub-molecular, levels. This course will introduce the scientific concepts and social challenges associated with cutting-edge biotechnologies in fields as diverse as medicine, genetics, agriculture, industry, food technology, and environmental management. We will explore technologies such as DNA sequencing, cloning, genetic engineering, stem cell therapies, GMO seeds, biofuels, among others. Students will learn core concepts in cellular and molecular biology in order to grasp the scientific mechanisms driving these technologies. You will also examine the ethical and social issues associated with different technologies as a way to understand the role of biotechnology in society. If you are curious to understand the fundamental components of life, explore the cellular and molecular world, or learn how the power of biology can be harnessed for the challenges facing the world today, this is the right course for you.

The laboratory provides practical insights into the role of DNA sciences in achieving and improving the technological applications to develop products to improve quality of life. Topics include: basic operations used in biotech labs, DNA extraction from living organisms, DNA cut and clone, making lots of copies of DNA, overproduction of protein, purification, plasmid isolation, DNA manipulation by PCR, transformation of E. coli with a recombinant plasmid, DNA purification and quantification, calorimetric detection of DNA, visualizing of DNA on gel electrophoresis and DNA fingerprinting.

BIO 114 + BIO 114L Biodiversity in the city

Credit Hours: 3+1
Fulfills: It fulfills Natural Science requirement in University's Habib Liberal Core, cross listed with SDP.
Prerequisites: None

Habitat alteration as a result of human activity is one of the leading threats to global biodiversity. Urbanization as a process significantly alters temperature, noise, air quality, hydrology as well as many abiotic factors. In this course, we will explore and document the communities of organisms that exist in Karachi alongside humans. We will investigate the consequences of urban environments and human social behavior on ecological systems and discuss factors such as nutrient cycling, behavior, phenology, disease, and patterns and process of biodiversity in urban systems, and importance of ecosystem services provided by these communities. In addition, we will discuss best practices in urban planning and development for promoting and preserving biodiversity and ecosystem processes. A significant component of this course will involve discussion of current scientific literature. This course will have a lab component where students will perform biodiversity surveys of plants, arthropods, and birds in their *mohallas*, examine the impacts of different urban activities on ecological communities and develop plans for protecting and promoting biodiversity across Karachi.

BIO 103/SDP 301 Global Health and Disease

Credit Hours: 3
Fulfils: Natural Science Requirement
Prerequisite: None

In this course, you will have the opportunity to explore health issues that cross-national boundaries and disciplinary confines. Unrestrained infectious diseases may conveniently cross borders leading to international catastrophes. Growing burden of noncommunicable diseases can affect developing and developed countries alike. Non-health sector issues such as climate change or trade have dramatic worldwide effects on health status. These are just a few examples of challenges requiring international mindedness: integration, collaboration, and coordination at a global level. In this course, you will access these issues, evaluate the strategies that are already in-place, think critically, and propose innovations to deal with and potentially solve the problems.

The class sessions in this course will embrace variable teaching and learning strategies for audio and visual learners, including but not limited to flip classes, debates, think-pair-share, activities and movies/video sessions etc.

CORE 100 Climate Change and Us

Credit Hours: 3
Fulfills: This course falls under the Form of Thought of Quantitative Reasoning. It also fulfils Natural Science requirement for SSE students.
Prerequisites: None

We live in a world where climate change has become an inescapable reality. It's like the dice has been rolled and we can now only wait and see what consequences it brings. Climate change is starting to influence all areas of our lives from food production, melting icecaps to frequent natural disasters. This course will develop a conceptual understanding of all the issues and impacts related to climate change and provide an opportunity to develop sustainable adaptation plans.

This course is designed to provide an introduction to climate change and its impacts on various aspects of our lives. The topic of climate change will be explored from different lenses such as its effects on humans, water, food, melting glaciers, and oceans among others. The course hopes to not only engage student learning through traditional teaching strategies but to bring in the expert knowledge that documentaries, case studies and guest speaker sessions offer us to fully cover every aspect of this global issue.

ENVS 102 Introduction to Environmental Systems

Credit Hours: 3
Fulfils: Natural Science Requirement, QR
Prerequisites: None

Environmental change as a result of human activities has emerged as the most pressing global challenge of our times, one with profound ecological, social and political implications and dire consequences. Addressing this challenge requires a rigorous understanding how natural systems operate and how human societies interact with these natural systems.

This survey course is designed to introduce students to the various environmental systems that enable life on earth and their linkages with human society. It is intended to be useful for both a broad-based introductory class on environmental science and as a useful supplement to specialist courses which wish to review the environmental systems dimensions of their areas of study. By covering a wide range of topics, review questions, case studies, and links to further resources, students will become conversant in the language and concepts of sustainability, and will be equipped for further study in sustainable management, planning, policy, economics, climate, ecology, infrastructure, and more.

ENVS 201 Science of Sustainability

Credit Hours: 3
Fulfils: Natural Science Requirement
Prerequisite: None

Environmental change as a result of human activities has emerged as the most pressing global challenge of our times, one with profound ecological, social and political implications and dire

consequences. Addressing this challenge requires a rigorous understanding how natural systems operate and how human societies interact with these natural systems.

This survey course is designed to introduce the essential scientific concepts pertaining to sustainability. It is intended to be useful for both a broad-based introductory class on sustainability and as a useful supplement to specialist courses which wish to review the sustainability dimensions of their areas of study. By covering a wide range of topics, review questions, case studies, and links to further resources, students will become conversant in the language and concepts of sustainability, and will be equipped for further study in sustainable management, planning, policy, economics, climate, ecology, infrastructure, and more.

ENVS/SDP 251 Water: Science, Society and Policy

Credit Hours: 3
Fulfils: Natural Science Requirement, QR
Prerequisite: None

Should water be released from a reservoir to generate electricity or be stored and used later for agriculture? Should river flows be maintained to preserve ecosystems or does domestic water consumption take precedence? How do droughts and shortage of freshwater exacerbate tensions between countries sharing water resources?

Water serves a diverse set of societal needs (economic, ecologic, cultural etc.), and in an increasingly water-stressed world affected by climate change, these needs are often in conflict. In this three-part course, we will tackle the afore-mentioned questions. Students will first be introduced to hydrological processes in the environment (aka the 'water cycle'). Next, we will focus on how various societies interact with the environment around them and in so doing, how they alter the hydrology around them. This will be done using case studies from around the world to investigate how changing hydrology due to climate change, and the various ways different societies use water, lead to conflicts. Finally, in the third part, students will learn about various stakeholder perspectives on Karachi's water system. They will then use this information to present an equitable plan to better manage the City's water system.

This course will expose students to important concepts in water resources policy and management. It is designed to help students develop an informed perspective on 21st century water challenges, and by extension, natural resource allocation problems. No pre-requisites are needed for this course.

ENVS 301 Introduction to Environmental Engineering

Credit Hours: 3
Fulfils: Natural Science requirement
Prerequisite: MATH 202

Environmental problems represent one of the gravest global challenges of the 21st century. Engineering sustainable solutions to these environmental issues is one of our most pressing needs. In this course, students will learn fundamental science and engineering principles needed for environmental engineering. Students will apply these principles to problems such as water supply and treatment systems, sewage treatment of municipal and industrial wastewaters, stream and air

pollution, and disposal of solid waste materials. In addition, this course will provide an overview of major themes in contemporary environmental engineering, including environmental impacts of socioeconomic changes, energy consumption and production, water supply and treatment, air pollution and global climate change.

Physics

PHY 101 Mechanics and Thermodynamics

Credit Hours: 3+0
Fulfils: Natural Science requirement; mandatory for EE
Prerequisite: None

Mechanics and Thermodynamics Topics include: Units and physical quantities, vectors, motion in 1-dimension, motion in more than 1-dimension, Newton's laws of motion and their applications, work and energy, potential energy and conservation law of energy, momentum and impulse, rotation of rigid bodies, dynamics of rigid bodies, gravitation, thermal properties of matter, laws of thermodynamics.

PHY 101L Mechanics and Thermodynamics Lab

Credit Hours: 1+0
Fulfils: Natural Science requirement; mandatory for EE
Prerequisite: PHY 101

Experiments include: simple harmonic motion observed through webcam, waves and oscillations, standing waves, resonance, moment of inertia of a tennis ball, rotational mechanics, rotational inertia, rotational friction, conservation of energy, latent heat of liquid nitrogen, heat capacity of solids, determined from boil-off of liquid nitrogen, conservation of momentum - elastic and inelastic collision, rotational motion, mass on a spring, basics of uncertainty analysis, Maxwell's wheel, light polarization, heat transfer, conduction, convection, Newton's law of cooling, temperature oscillations, Fourier analysis.

PHY 102 Electricity and Magnetism

Credit Hours: 3+0
Fulfils: Physics Minor Foundational Course
Prerequisite: PHY 101

Electricity & Magnetism Topics include: Electromagnetism and electrostatics, electric charge, Coulomb's law, electric field, Gauss's law, electrostatic potential, magnetic fields, Biot-Savart law and Ampere's law, magnetic materials, time-varying fields and Faraday's law of induction, Hall effect, displacement current and Maxwell's equations.

PHY 102L Advanced Physics Lab

Credit Hours: 1+0
Fulfils: Physics Minor Foundational Course
Prerequisite: PHY 102

Experiments include: determination of Curie point of a Ferro-magnet by controlled electric heating, observing Hall effect in semiconductors, magnetic moment of a conductor loop in a magnetic field, determining Verdet's constant, Frank-Hertz Meter, determination of Planck's constant from the spectrum of a tungsten light bulb, optical activity of a chiral (sugar) solution, imaging electron trajectories using a magic eye, image analysis, Lenz's Law, band gap measurement of pure Ge, magnetic pendulum, exploring phase portraits, chaos, bifurcations, Spectral Lines of different gasses.

PHY 104 Introduction to Nano Science

Credit Hours: 3+0
Fulfils: Natural Science requirement and university wide free elective
Prerequisite: None

Nano-Science is a significant area of science which deals with the understanding of the properties of materials at nano-nanoscale—the world where atoms, molecules (atoms joined together), proteins, and cells rule the roost. It is the place where science and technology gain an entirely new meaning. This course offers a basic introduction to understand nanoscience and explore its applications through nanotechnology: where we can put the science into action to solve our problems.

PHY 201 Modern Physics

Credit Hours: 3+0
Fulfils: Physics Minor Foundational Course
Prerequisite: PHY 101, PHY 102, MATH 102, MATH 203

Topics include: Review of basic mechanics, introduction to special relativity, relativity and Physics, Planck's radiation law, photo electric effect, Compton scattering, pair production, Bohr's theory of Hydrogen atom, basics in quantum mechanics, Schrodinger's equation and its applications, ideal gas equation, Maxwell's distributions, Boltzmann's distributions, Identical particles.

PHY 202 Quantum Mechanics

Credit Hours: 3+0
Fulfils: Physics Minor Foundational Course
Prerequisite: PHY 101, PHY 201, MATH 203

Topics include: Particle aspects of radiation, wave aspects of particles, quantum systems and indeterminacy, quantization rules, wave packets, mathematical tools of quantum mechanics, postulates of quantum mechanics, one-dimensional problems in quantum mechanics, angular momentum, more than 1-dimensional problems, rotations and addition of angular momenta, time dependent and independent approximation methods in quantum mechanics, scattering theory.

PHY 300/CS 314 Quantum Computing

Credit Hours: 3+0
Fulfils: CS Theory Elective; Physics Minor
Prerequisite: MATH 101, MATH 102, MATH 205, Data Structures and Algorithm, OR PHY 202 OR instructor permission

Quantum computers are physical devices that exploit the laws of quantum mechanics to solve certain problems faster than Turing machines, and in doing so negate the extended Church-Turing thesis, a fundamental conjecture in traditional computer science. Computer science students will learn a new and promising model of computation, and physics students will learn to analyze physical theories in terms of information and computation.

PHY 301 Classical Mechanics

Credit Hours: 3+0
Fulfils: Physics Minor Elective Requirement
Prerequisite: PHY 101, MATH 203.

This is an advanced course in the area of Mechanics which employs a different approach to studying mechanical systems. The course focuses on Lagrangian and Hamiltonian approaches to understanding and modeling mechanics systems. It starts with reconsidering physical systems already familiar to the reader, such as simple harmonic motion, free particles, rotations, spring systems etc. using Lagrange formalism which is one of the most widely used approaches in a number of areas of Physics. Later on, it further generalizes the formalism and eventually the formalism is applied to continuous systems, hence field theory

PHY 302 Mathematical Methods for Physics

Credit Hours: 3+0
Fulfils: Physics or Math Minor Elective requirement
Prerequisite: MATH 101, MATH 102, MATH 202, MATH 205 or instructor permission

Learning advanced Physics requires mastery of a variety of mathematical techniques. This course covers some of the most common and useful of these techniques, thereby preparing students to take higher-level courses in Physics. Grappling with advanced mathematics, will turn students into more mature mathematicians, and equip them to become proficient scientists and engineers.

Students should come prepared knowing the fundamentals of single- and multi-variable calculus, the solutions of standard differential equations, and linear algebra. Building upon these fields, we will learn tensor calculus, operator theory, advanced techniques for solving differential equations, and calculus of variation. There will be an emphasis on proofs and understanding why theoretical techniques are able to yield solutions to applied problems.

No background knowledge of Physics is required for this course. However, Physics problems will sometimes be discussed in class, but students will not be tested on their modeling ability. Therefore, Electrical Engineering and Computer Science students, will be able to derive full value from this course.

PHY 351 Introduction to Statistical Mechanics

Credit Hours: 3+0
Fulfils: This course is designed as an independent study to meet the elective requirement for a Physics minor.
Prerequisite: PHY 201, PHY 202, PHY 301 MATH 202, MATH 205, ME 302 Engineering Thermodynamics, EE 354/MATH 310

Statistical mechanics links the microscopic properties of physical systems to their macroscopic properties. Thermodynamics, which describes macroscopic properties, can then be derived from statistical mechanics with a few well motivated postulates. It leads to a microscopic interpretation of thermodynamic concepts, such as thermal equilibrium, temperature and entropy. In this course, the basic principles of statistical mechanics will be introduced with applications to the physics of matter.

PHY 352/MATH 352 Group Theory for Physicists

Credit Hours: 3+0
Fulfils: Physics minor, Mathematics Minor, Free Elective
Prerequisite: MATH 101, MATH 205 OR Instructor Permission

This course introduces students to group theoretic methods that allow them to analyze physical systems using symmetries. These methods are wide applicability in various branches of physics, as well as in Engineering and Computer Science. The identification of symmetries often lets one simplify a problem, and solve it in mathematically and conceptually elegant ways.

PHY 358 Astro Statistics: Statistical Inference in Astrophysics/Cosmology

Credit Hours: 3
Fulfils: Physics Minor, Mathematics Minor, Free Elective
Prerequisites: MATH 101, MATH 205 OR Instructor Permission

The known universe contains a lot of stars, galaxies and other objects. To a rough estimate there are 100s of billions starts in our galaxy and there are approximately almost 100 exist in the known universe. Modern cosmological and astrophysical observations are gathering enormous amount of data which requires researchers to come up with novel ways to interpret those data and find interesting information. Using the statistical tools people can measure the reliability of their measurements, quantify uncertainties in their theoretical models and find interesting patterns in observational data.

PHY 401 Quantum Mechanics II

Credit Hours: 3+0
Fulfils: Physics Minor Elective Requirement
Prerequisite: PHY 301, PHY 202, PHY 302, Partial Differential Equations

The course specifically serves as one of the prerequisites for research in quantum field theory, particle physics, cosmology, and related areas. The course is designed to bridge the knowledge in Lagrangian (and Hamiltonian) approach, mathematical physics, and quantum field theory.

The course is designed to expose students to some of the very active research areas in theoretical physics at its most fundamental scale. It is expected to enable students to learn the basics of quantum field theory which is among the irreplaceable prerequisite for any research being currently pursued in quantum field theories, particle physics, string theory, supersymmetry etc.

Mathematics

MATH 101 Calculus I

Credit Hours: 4
Fulfils: This course meets requirements for EE, ECE and CS majors and Mathematics Minor for non-DSSE students.

The course covers important pre-requisite content related to functions, their behavior, and multiple contexts for which they serve as an important modelling tool. This course fulfills a foundational mathematics course requirement for the Electrical Engineering, Computer Engineering and Computer Science majors. It is also a mandatory requirement for all non-DSSE students wishing to pursue a Mathematics Minor.

MATH 102 Calculus II

Credit Hours: 3
Fulfils: This course meets requirements for advanced courses in EE, ECE and CS majors and Mathematics & Physics Minor for non-DSSE students.
Prerequisite: MATH 101

Calculus is a very important part of Applied Mathematics which in turn serves as an important tool in Science and Engineering. In Calculus I you studied the fundamental concepts of function and the techniques of differentiation and integration. Calculus II builds upon the concepts of calculus learned in the previous course and extends them to other areas of Applied Mathematics such as multivariable functions and vectors.

MATH 105 The Art of Mathematics

Credit Hours: 3
Fulfils: Elective for Math Minor and fulfils Quantitative Reasoning requirement for AHSS students.

This course will explore multiple theorems, arguments, and quantities that have been relevant to a variety of fields through history, such as art, architecture, astronomy, and the physical sciences.

Tracing the birth of geometric reasoning from the time of Euclid to looking at the birth of trigonometry as a tool for astronomical calculations and models, students will be introduced to geometry, algebra, and topology through various contexts. Students will be expected to use these concepts to create culminating projects using design and mathematical software.

Note: This course will also fulfil one (01) of the math requirements for the students pursuing a Communication and Design major.

MATH 106 Music and Mathematics

Credit Hours: 3
Fulfils: This course meets requirements for a Quantitative Reasoning elective and is a required course for the completion of a South Asian Music Minor.

This course serves as a bridge between two areas of learning that are not popularly associated with each other. However, music and its development in various cultures around the world have often relied upon mathematical frameworks. The study of mathematical concepts behind musical ideas is a classic example of interdisciplinary learning in the liberal arts model.

This course will introduce the rudiments of Western and South Asian musical theory, with a focus on the mathematics incorporated in their development and overall structure. The course will explore the properties of the twelve-tone scale, the historical evolution of tuning and temperament, the idea of combinational tones and consonance, and the physics behind the construction of musical 96 instruments. Looking primarily at South Asian and Western musical genres, students will also analyze the mathematics involved in music composition, for both melody and rhythm.

MATH 107 Lie Detector: An Introduction to the Practice of Statistics

Credit Hours: 3
Fulfils: It fulfills quantitative reasoning requirements for AHSS and SSE students

In the age of big data, it is difficult to differentiate knowledge from misinformation. Statistics, as a field, is concerned with quantifying uncertainty. Statistics are tools to summarize and describe patterns in reality and to explore the causal processes leading to these patterns. Understanding how statistics are used and misused is vital for assessing and assimilating information in any field. The goal of this course is to help students understand the philosophy of inference, develop a scientific process for posing questions, collecting and interpreting relevant data, and familiarize them with common statistical tools so that they can apply evidence-based decision making in their lives. We will review core principle and concepts in probability and statistics, using project-based learning to focus on practical application rather than theory. All students are expected to attend three-hour computer labs every week where they will be using the R statistical language to review statistical concepts and principles learned during lecture. This course is aimed at all SSE and AHSS students, especially those who are intimidated by mathematics, working with numbers or programming.

MATH 108 An Introduction to the Practice of Statistics

Credit Hours: 4
Fulfils: It fulfils quantitative reasoning requirements for AHSS and DSSE students

In the age of big data, statistical analysis forms the core of policy-making, product development and marketing, business decisions, scientific analysis, and just about every practical domain. Statistics, as a field, is concerned with quantifying uncertainty to summarize and describe patterns in reality, and to explore the causal processes leading to these patterns. Understanding how statistics are used and misused is vital for assessing and assimilating information in any field. The goal of this course is to help students understand the philosophy of inference, develop an information-based approach to defining and addressing inquiry, collect and interpret relevant data, and familiarize themselves with common statistical tools so that they can make evidence-based decisions. We will review core principles and concepts in probability and statistics, using project-based learning to focus on practical application rather than theory. All students are expected to attend three-hour computer labs every week where they will be using Excel to review statistical concepts and principles learned during lectures. This course is aimed at all SSE and AHSS students, especially those who are intimidated by mathematics and numbers.

MATH 202 Engineering Mathematics

Credit Hours: 3
Fulfils: Mandatory Math requirement for all DSSE students
Prerequisite: MATH 102

Topics include: Vector Calculus (vector functions, line and surface integrals). Elementary methods for solving first order ODEs (direct integration and substitution) with geometric interpretation and classification, separable ODEs, method of integrating factors. Vector algebra (including matrix algebra, eigenvalues and eigenvectors, quadric surfaces). Dynamical systems (linear systems of ODEs, stability and phase portraits of dynamical systems). Second, order ODEs - elementary methods including their classification, reduction of order techniques, linear second order ODEs with constant coefficients, and finding particular solutions. Orthogonal functions and Fourier series solutions (generalized and trigonometric methods), convergence in the mean and pointwise convergence, odd and even expansions, half-range expansions. Partial differential equations (PDEs) (wave, heat and Laplace equations), solutions using Fourier series and Laplace transforms, and Schr dinger equation.

MATH 203 Advanced Differential Equations

Credit Hours: 3
Fulfils: Math Minor Elective
Prerequisite: MATH 201 for CS and EE students; MATH 102 with min 70% score for non-engineering students in MATH Minor.

Topics include: A brief revision of first- and second-order ordinary differential equations (ODEs) with constant coefficients. Differential operators, Wronskian and linear independence. Numerical solution methods for ODEs: Euler method, Taylor series solution up to 2nd order, Runge-Kutta methods up to 2nd order; Cauchy-Euler equations; Power series and Frobenius' methods including

Ordinary points, singular points, regular points, analytic functions, indicial equation. Bessel function and Bessel's equation, Legendre equations. Boundary value problems for homogeneous linear 2nd order ODEs: Boundary values, Sturm-Liouville problem, Eigen functions and corresponding eigenvalues, Fourier Bessel series. Inner products and norms of functions. Self-adjoint operators, and Schrodinger equation.

MATH 205 Linear Algebra

Credit Hours: 3
Fulfils: Mandatory Math requirement for all DSSE students
Prerequisite: MATH 201

Topics covered: A brief revision of vector algebra including lines and planes in 3D and matrices, Determinants, Symmetric matrices, and quadratic forms; Elementary row and column operations of a matrix; Systems of linear equations and their solutions, existence, and uniqueness of solutions; Vector spaces; Inner products and ortho-normalisation; Orthogonal transformations and rotations; Linear transformations, orthogonality, QR factorization, Hermitian and Unitary transformations; Least squares analysis and approximations; Singular value decomposition; Direct sum decomposition; and Caley-Hamilton Theorem.

MATH/PHIL 222 Paradox and Infinity

Credit Hours: 3
Fulfils: This course meets requirements for the Habib Liberal Core curriculum (Quantitative Reasoning)

The notion of a 'paradox' has been central to the development of human knowledge. Through much of the history of philosophy, there have been certain major paradoxes that have drawn the attention of some of the greatest minds in each era. Sometimes these paradoxes may seem extremely simple and trivial. So trivial, in fact, that someone may think that they are some sort of parlor trick. The temptation to treat them as nothing more substantial than verbal legerdemain can be strong. And yet, generation after generation, era after era, they continue to persist. To take a simple example, try this:

> The sentence right below this one is false.

> The sentence right above this one is true.

This seemingly simple paradox (a version of the so called 'liar' paradox) has been at the core of some of the most far-reaching developments in philosophy and science. Various attempted resolutions to it have led in surprising and unexpected directions.

In this course we will familiarize ourselves with some of the most famous paradoxes in history and look at some of the attempted solutions. It is not our purpose to endorse any solution—since many current thinkers still regard them open and unsolved problems. Instead, our intention is to gain a deeper acquaintance with some of these famous puzzles and how people have tried to overcome them.

In the second part of the course, we will investigate another notion that has continued to fascinate and confuse in equal measure for millennia. This is the notion of "infinity" and has quite famously been a 2 source of many famous paradoxes. Is infinity even possible in the real world? Is it even a coherent idea? Can there be many infinities? Are some infinities smaller or bigger than other infinities? Does it even make sense to talk about infinities as if they are normal notions? These notions come into sharp focus when we investigate some of history's most famous paradoxes, i.e., the paradoxes we have inherited from the ancient sage Zeno of Elea (and available to us through the writings of Aristotle, who attempts his own 'solution' to them). Despite repeated claims by different thinkers to have solved them or mocking dismissals (C. S. Peirce famously called them 'ridiculous'), they refuse to go away and discussion around them continues. The discussions around infinity, moreover, have had consequences in fields as diverse as theology and mathematics. There are, for instance, arguments for the existence of God that turn on whether infinite time is possible. There are arguments for the non-existence of God based on denying the possibility of infinite knowledge. There are schools of theology in Islamic history (famously the Ashari atomists, summarized by Maimonedes) that have used a denial of infinity as the very basis of their entire metaphysical conception of reality. On the other hand, the notion of completing a procedure in "a finite number of steps" is core the notion of whether something is provable or solvable via algorithms—an idea that has reared its head quite significantly over 20th century mathematics and computability theory. A notion with this broad an application is certainly worth examining. While it will not be claimed that we have fully comprehended what it means, we will examine the attempts of those who have tried to articulate and analyze this notion, hoping to demystify it.

MATH 304 Real Analysis

Credit Hours: 3
Fulfils: This course meets elective requirements for EE and CS programs as well as minor in Mathematics.
Prerequisite: MATH 101, MATH102

In this course, we try to understand and appreciate the rigor that mathematics is known for. For all its applications, we must be able to say with absolute certainty that, given a small set of axioms and the rules of logic, our mathematics is consistent.

The course is intended to expose the students to the basic ideas of Real Analysis. Some of the questions that we address are as follows:
- What are real numbers?
- Is there a largest real number?
- What is the real number that comes directly after 0?
- Are there any 'holes' in the real number line?
- Even numbers and odd numbers add up to form natural numbers, does that mean even numbers are less than natural numbers? What about the size of real numbers compared to the size of natural numbers? Is there more than one infinity?
- What are sets? Functions? Measure and distance? Continuity?

MATH 305 Complex Analysis

Credit Hours: 3
Fulfils: Math Minor Elective
Prerequisite: MATH 101, MATH 102

Specific topics covered in this course are: Complex Algebra and the Complex Plane and its Motivation, Polar Form, Complex Exponential, deMoivre's Theorem, Powers and Roots, Sets of Points, Complex Functions and Linear Mappings ,Limits and Continuity for Real and Complex Functions, Differentiability and Analyticity, Cauchy-Riemann Equations, Harmonic Functions, Elementary functions (Exponential, Trigonometric and Logarithmic Functions and Complex Powers), Line & Contour Integrals, Complex Integration, Cauchy's Integral Formulas, Sequences and Series , Taylor Series, Power Series, Convergence, Laurent Series, Zeros and Poles, Newton's Method and Fractals, Residues and Residue Theorem

MATH 333 History of Number Theory

Credit Hours: 3
Fulfils: Math Minor Elective

Number Theory, or arithmetic/higher arithmetic, as it was called in ancient times, is one of the oldest and most popular branches in mathematics, as its problems are easy to comprehend, yet sometimes incredibly hard to solve. Brahmagupta concluded over 2500 years ago, when studying arithmetic, that "These problems arestated merely for pleasure. The wise man can devise a thousand rules or he can solve the problems of others by the rules given here. As the sun obscures the stars so does the man of knowledge eclipse the glory of other mathematicians in an assembly of people by proposing algebraic problems and still more by solving them."

Positive integers are seen to be the first mathematical creation of humans and we are going to start the course by introducing different ancient number systems in various civilizations and the first arithmetic operations. After this introduction we are going to focus on mathematics in ancient Greece, mainly under Plato, Euclid and Diophantus and in particular the connection between geometry and number theory that they established (It will also be highlighted if similar discoveries were made for example in India).

The course will then continue with medieval Islamic mathematics, their appropriation of Greek, Indian and Persian texts resulting in the Hindu-Arabic number system and further studies on 'special' numbers, such as perfect numbers, primes, amicable numbers and their properties and the influence of al-Khwarizmi's introduction of Algebra on number theory problems. This will then segue into Europe in the late Renaissance, thanks to a renewed study of the works of Greek antiquity (often arriving in Europe in Arabic).

MATH 351 Topology

Credit Hours: 3
Fulfils: This course meets elective requirements for CE, EE and CS programs as well as the minor in Mathematics.
Prerequisites: MATH 101, MATH 102

The independent study is designed to be a first introduction to Point-Set Topology. The last few weeks are dedicated to understanding the basics of another aspect of topology, namely Algebraic Topology. The topics are particularly chosen in such a way as to equip the students to later diverge into different streams within topology according to their interests.

EE 354/MATH 310 Introduction to Probability and Statistics

Credit Hours: 3
Fulfils: This course meets program requirements and Quantitative Reasoning (QR) forms of thought for EE, CE & CS majors.
Prerequisites: MATH 102

In the present world, we encounter situations where we have to make decisions on the basis of incomplete or imperfect information. The theory of probability helps provide a formal mechanism for understanding, quantifying, and dealing with uncertainty, which is ever present in our lives, pure science, or engineering applications. Simply, by uncertainty we mean the condition when outcomes or future are not completely determined or can be captured by a deterministic function; they depend on a number of factors and perhaps just on pure chance. A lot of our present-day technologies will not be possible without an understanding of how to make decisions in presence of uncertainty. These technologies include all forms of wireless communication, servers, speech processing systems, network systems and so many more. Equipping yourself with tools to deal with uncertainty will help you with whatever you wish to pursue in life.

This course will cover the foundations of probability, random variables and statistics, with a plethora of examples from electrical engineering, computer engineering, computer science, and everyday life. The course content can broadly be divided into three categories: -

1. Fundamentals of probability,
2. Common probability models,
3. Inferences & statistics.

Other Electives

ENER 104 Renewable Energy: Why, What and How?

Credit Hours: 4
Fulfils: This course meets Natural Science requirements for DSSE students and can count as a free elective to students from all other majors.
Prerequisite: None

Our reliance on energy systems has been increasing consistently since the industrial revolution. This reliance has increased greatly with the ongoing revolutions of InfoTech and biotech. While multiple alternate sources of energy are being used and researched, coal, oil and gas continue to be the world's top energy sources accounting for about 65% of global demand. This over reliance on fossil fuels has resulted in an unprecedented emission of CO_2 and other greenhouse gases which has triggered the first man made geological age which can threaten the existence of all living species on earth. It is not

likely that we will reduce our energy needs anytime soon which makes it critical to find alternate energy sources that can fuel our energy needs while avoiding any negative impact on our environmental ecosystems. Through this course, we will explore why do we need renewable energy sources, what's wrong with the current energy systems and what are the options available to us outside of regular sources of coal, oil and gas. We will study the operation of various renewable energy sources including, wind energy, solar energy, hydropower, biogas, hydrogen fuel cells and tidal energy. While using the current energy production and consumptions patterns, we will try to speculate the energy needs of Pakistan in the coming decades with a focus on energy needs by 2047. The course is supported through a lab where students will get to work with multiple renewable devices and analyze their functioning and limitations.

SCI 101 Introduction to Sustainability

Credit Hours: 3
Fulfills: This course is part of the Habib Liberal Core and meets the requirements for Quantitative Reasoning, and Natural Science courses.
Prerequisite: None

This course is designed to introduce the essential concepts of sustainability. This subject is of vital importance as it seeks to uncover the principles of the long-term survival and welfare of all the inhabitants of our planet. The course is intended to be useful for both a broad-based introductory class on sustainability and as a useful supplement to specialist courses which wish to review the sustainability dimensions of their areas of study. By covering a wide range of topics, review questions, case studies, and links to further resources, students will become conversant in the language and concepts of sustainability, and will be equipped for further study in sustainable management, planning, policy, economics, climate, ecology, infrastructure, and more.

SCI/CS 122 Inventing the Information Age

Credit Hours: 3
Fulfils: Natural Science elective, CS elective
Prerequisite: None

Our current era is often referred to as the information age, because of the widespread use of information processing capabilities that are used for human benefit in a wide variety of ways. This era is enabled by a number of scientific and technological inventions such as computers and communication technologies. The effect of these inventions has been felt through significant social, economic and political change.

This course surveys the key physics, mathematics and computer science inventions that enable the information age. We will study the basics of important physical constraints and phenomena that are used to build information processing devices. We will understand how coding theory allows us to reliably transmit, store and compute information on error prone physical devices. We will also discuss essential cryptographic techniques to securely transmit and store important information. The course will end with an outlook of future innovations that will further enhance humanities' information processing capabilities.

SCI 221 Design thinking for Sustainability

Credit Hours: 3
Fulfills: "This course falls under the Form of thought of Creative Practice"
Prerequisites: Introduction to Sustainability / Energy / Climate Change and Us

This course provides an introduction to the principles of design thinking and allows an opportunity to deploy these principles for solving a sustainability challenge. Design thinking offers a systematic approach to unleash the innovative and creative forces of individuals in a collaborative space. It applies methodologies of design to solve challenges to the environment and society and at the same time provides a more engaged and practical learning opportunity.

The course will involve a human-centered design process where the students will learn and work in a team-based community project throughout the semester. Their learning will be supported through readings, workshops, videos, discussions, in-class activities and reflection assignments. Students will also spend a significant amount of time observing, listening, analyzing, discussing, reflecting and engaging with their classmates as they design, develop and implement meaningful and innovative projects on sustainability.

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 University

S. No	Minors	Offering Program	Offering School	No of Courses	Credit Hours+
1	Comparative Literature	CH	SAHSS	06	18-20
2	Philosophy			05	15-20
3	Religious Studies			05	15-20
4	History			05	15-20
5	South Asian Music	Center for South Asian Music and CH		05	15*
6	Communication	CND		05	19
7	Design			05	18
8	Social Development & Policy	SDP		05	18
9	Physics	ISciM	DSSE	07**	20
10	Mathematics			07	20
11	Bioscience			05	17
12	Computer Science	CS		07	21
13	Electrical & Computer Engineering	ECE		08	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

1. Comparative Literature (CL)

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

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

All Habib University students (class of 2023 onwards), except those majoring in the CH program, are eligible to declare and pursue the CL Minor.

Requirements for the Comparative Literature Minor (Class of 2026)

Courses	No. of Courses	Credit Hours
Core Courses		
LIT 104: What is World Literature? **OR** Any another course that satisfies the requirement, as approved by the Board of Faculty	01	03-04
LIT 225 Intro to Literary Theory and Criticism	01	03
CORE 121 Jehan-e-Urdu*	01	04
LIT Electives (Two upper division Literature electives)		
300 or 400-level LIT elective	01	03-04
400-level LIT elective	01	03-04
CH Elective One course within the area of concentration - South Asian or World Literature		
CH Elective (excluding from the Habib Liberal Core)	01	03-04
Overall	06	18 (min)

- Students must take all the 06 courses as specified above to qualify for the CL minor.
- Courses cleared with C minus / passing grade can go on the grid for CL Minor.
- *Can be double counted in both HLC & minor
- No single Habib Liberal Core course can count towards fulfilling requirements towards completion of more than one of CL, HIST, RELS, and PHIL Minors

2. Philosophy

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

1. 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.

2. 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.

3. 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.

4. 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.

All Habib University students (class of 2023 onwards), except those majoring in the CH program, are eligible to declare and pursue the Philosophy Minor.

Requirements for the Philosophy Minor (Class of 2026)

Courses	No. of Courses	Credit Hours
Core Courses		
PHIL 200: What is Philosophy? **OR** PHIL 122 Introduction to Western Philosophy **OR** *any another course that satisfies the requirement, as approved by the Board of Faculty*	01	03-04
CORE 202 Hikma 1, **OR** CORE 111 Logical Problem-Solving **OR** CS 101 Programming Fundamentals	01	03-04
Intermediate Course		
Course in Epistemology or Ontology ranging from 200 & above^ **OR** *any other course satisfying the requirement recommended by the Board of Faculty (list below)*	01	03-04
Electives		
Any two advanced level (300 or 400 level) electives in PHIL.	02	06-08
Overall	05	15-20

*   If both are taken as separate courses, one counts as an advanced level elective course.
-    Students must take all the 05 courses as specified above to qualify for the Philosophy minor.
-    Courses cleared with C minus / passing grade can go on the grid for Philosophy Minor.
-    ^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 list of relevant courses below)

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

Courses that satisfy the intermediate course requirement of the Philosophy 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

3. Religious Studies

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

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

All Habib University students (class of 2023 onwards), except those majoring in the CH program, are eligible to declare and pursue the Religious Studies Minor.

Requirements for the Religious Studies Minor (Class of 2026)

Courses	No. of Courses	Credit Hours
Core Courses		
RELS 102 Introduction to World Religions **OR** RELS/HIST 223 Making of Modern World Religions.	01	03-04
CORE 202 Hikma 1 – History of Islamic Thought	01	03-04
Intermediate Course		
REL223: Comparative Approaches, Methods and Key Issues in the Study of Religion *(Or any approved course that satisfies the requirement)*	01	03-04
Electives		
Any two advanced level (300 or 400 level) electives in RELS.	02	06-08
Overall	**05**	**15-20**

Courses	No. of Courses	Credit Hours
- *Students must take all the 05 courses as specified to qualify for the Religious Studies Minor.* - *Minimum 15 credits.* - *CORE 302: Hikma II can be one of two electives provided the student is not already counting Hikma II for the second philosophical thought requirement in the Habib Liberal Core.* - *Courses cleared with C minus / passing grade can go on the grid for Religious Studies Minor.*		

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

6. 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

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

All Habib University students (class of 2023 onwards), except those majoring in the CH program, are eligible to declare and pursue the History minor.

Requirements for the History Minor (Class of 2026)

Courses	No. of Courses	Credit Hours
Core Courses		
Course in Global Histories such as HIST 332 History of Brazilian Independence (Global Histories) **OR** HIST 225: Latin American History **OR**	01	03-04

Courses	No. of Courses	Credit Hours
HIST/SDP 190: (Global Histories) Military Regimes in South Asia and South America **OR** HIST 2xx: (Global Histories) Political Islam *(OR another course that satisfies the requirement and approved by the Board of Faculty)*		
CORE 201Pakistan and Modern South Asia (PAMSA)	01	03-04
Intermediate Course		
Course in Historical Methods, Historicity or Histography Such as HIST 327: Understanding Histories: Historiography and Historical Methods OR another course that satisfies the requirement and approved by the Board of Faculty	01	03-04
Electives		
Any two advanced level (300 or 400 level) HIST electives.	02	06-08
Overall	**05**	**15-20**
- *Students must take all the 05 courses as specified above to qualify for the History minor.* - *Minimum 15 credits.* - *Courses cleared with C minus / passing grade can go on the grid for History Minor.*		

Note: No single Habib Liberal Core course can count towards fulfilling of more than one of 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

1. 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).*

2. 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.
3. Articulate the mathematics inherent to musical forms and the mathematics used to generate musical ideas
4. 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.
5. 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.

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

Requirements for the South Asian Music Minor (Class of 2026)

Courses	No. of Courses	Credit Hours
Core Courses		
MUS 101 Music of South Asia: Styles and Structures	01	03
MATH 106 Music and Mathematics	01	03
MUS 222 Sound and Subjectivity	01	03
MUS 221 Humari Meeras: History and Discourse in South Asian Music	01	03
Elective in History, Theory or Practice		
One elective course in History, Theory or Practice approved by the CH program. The courses that currently qualify for such an elective are: • Introduction to Pakistani Film Music (LIT 121) • Breathing Bansuri (MUS 111) Musicking: The Anthropology of Music (ANT 2XX) The Science of Sound	01	03
Other		
Three semesters of practicum in Music Lessons offered at the Khawaja Mashooqullah Music Room, offered through the Centre for South Asian Music.		
Overall	**05**	**15**

- *Students must take all the 05 courses and 3 semesters of enrollment in the Music Room Lessons*
- *The student should have a C+ or higher grade in all the 5 courses plus 85% attendance in the Music Room lessons for the 3 semesters.*
- ** 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 Center for South Asian Music.*

6. Communication

Offered by: Communication and Design (CND) Program

The Communication (COM) minor is based around a condensed curriculum in New Media Production and Media Studies. Theory and practice are twinned in this minor, and the required courses will provide students with foundational to intermediate skills in media production, along with a proficient understanding of the global aesthetics of cultural production, with the aim to eventually apply this knowledge to the local context. Students will be able to use the two required electives to delve a little deeper into the kind of production they want to practice, or take more seminar courses in media studies and history if their interests lie in examining the impact of cultural production on society.

Learning Outcomes

By taking this minor, students will be able to

- Produce New Media artefacts aimed at knowledge creation, awareness generation and social change, among others
- Engage in creative and divergent thinking to approach content creation in innovative ways
- Demonstrate a capacity to think beyond disciplinary epistemes when considering the role of media in modern society

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

Requirements for the Communication Minor (Class of 2026)

Courses	No. of Courses	Credit Hours
Required Courses		
CND 103 Intro to Design and Media	01	04+01
COM 201 Production Fundamentals	01	04+01
COM 204 Elements of Aesthetics I	01	03
Elective Courses		
100/200 level COM elective	01	03-04
300/400 level COM elective	01	03-04
Overall	**05**	**19-21**
- *Minimum Grade: C minus / HU passing grade in all courses for the minor* - *Double counting is not allowed* - *Transfer of credits is allowed only with the approval of the program*		

7. Design

Offered by: Communication and Design (CND) Program

This research and participatory design centered minor aims to provide students of other programs with foundational-to-intermediate skills and methodologies in human centered design. Students will be required to take both studio and seminar courses in order to complete this minor, and can expect to spend their time in these courses learning how to understand peoples' needs and respond to them with appropriate and innovative interventions.

Learning Outcomes

By taking this minor, students will be able to

- Conduct research on local communities along the principles of human centered design to achieve an empathetic and holistic understanding of their needs
- Engage in creative and divergent thinking to approach problems in innovative ways
- Develop interventions in the form of products or services in order to bring about meaningful societal change

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

Requirements for the Design Minor (Class of 2026)

Courses	No. of Courses	Credit Hours
Required Courses		
CND 103 Intro to Design and Media	01	04+01
DES 203: Designing for and with People	01	04+01
DES 302: Design for Social Change OR DES 204: Research in Design	01	02
Elective Courses		
100/200 level DES elective	01	03-04
300/400 level DES elective	01	03-04
Overall	**05**	**18-20**
- Minimum Grade: C minus / HU passing grade in all courses for the minor *- Double counting is not allowed* *- Transfer of credits is allowed only with the approval of the program*		

8. Social Development and Policy

Offered by: Social Development and Policy (SDP) Program

Students from all majors except those majoring in SDP can pursue the SDP minor.

Requirements for the Social Development & Policy Minor (Class of 2026)

Courses	No. of Courses	Credit Hours
Required Courses		
SDP 101 Development and Social Change	01	04
SDP 201 Qualitative Research Methods OR SDP 202 Quantitative Research Methods	01	04
SDP 301 Public Policy OR SDP 204 Public Policy 1	01	04
SDP Electives		
SDP Elective (any level)	01	03-04
Upper-level SDP Elective (300 or 400 level)	01	03-04
Overall	**05**	**18-20**

- *Minimum Grade: C minus / HU passing grade in all courses for the minor*
- *Double counting is not allowed*
- *Transfer of credits is allowed only with the approval of the program*

Minors Offered by Dhanani School of Science and Engineering

1. 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.

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

Requirements for the Physics Minor (Class of 2026)

Courses	No. of Courses	Credit Hours	Prerequisite(s)
Foundational Courses			
PHY 101 Mechanics & Thermodynamics	01	03	
PHY 201 Modern Physics	01	03	PHY-101 Mechanics and Thermodynamics
PHY 202 Quantum Mechanics	01	03	PHY 201 Modern Physics PHY 101 Mechanics and Thermodynamics
PHY 241 Electromagnetic Theory	01	03	MATH 202 Engineering Mathematics or equivalent
PHY 101L Mechanics & Thermodynamics Lab	01	01	PHY 101 Mechanics & Thermodynamics
PHY 102L Advanced Physics Lab	01	01	PHY 101L Mechanics & Thermodynamics Lab
Electives			
Program electives from the list below	03	09 -12	
Overall	**09**	**23-26**	

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

Electives offered by the program that fulfil the Physics minor requirements:

Elective Courses	Credit Hours	Pre-requisites
ME 342 Introduction to Nanotechnology	03	PHY 201, PHY 202
PHY 300/CS 314 Quantum Computing	03	MATH 101, MATH 102
PHY 301 Classical Mechanics	03	MATH 101, MATH 102, MATH 202, MATH 205
PHY-302 Mathematical Methods for Physics (also valid for Mathematics Minor)	03	PHY 101, MATH 101, MATH 102, MATH 202
PHY-351 Introduction to Statistical Mechanics	03	PHY 202
PHY-401 Quantum Mechanics II	03	EE 241
PHY-441/EE-441 Antennas and Wave Propagation	03	PHY 101, MATH 101
PHY-360/ME-302 Engineering Thermodynamics	03	MATH 113, MATH 205, CS 102

Please note that the offering of electives is subjected to the availability of faculty and is contingent on the number of students enrolled. 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.

2. 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.

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

Requirements for the Mathematics Minor (Class of 2026)

Courses	No. of Courses	Credit Hours	Prerequisite(s)
Foundational Courses			
MATH 102 Calculus II	01	03	MATH 101 Calculus I
MATH 202 Engineering Mathematics	01	03	MATH 101 Calculus I
MATH 205 Linear Algebra	01	03	MATH 202 Engineering Mathematics
MATH 310/ EE 354 Probability & Statistics	01	03	None
Electives			
Electives from the list below with at least two of them of 300-level or higher.	03	09 -12	
Overall	**09**	**23-26**	

- *Math 0xx level courses cannot be taken to satisfy the minor.*
- *DSSE students have a mandatory requirement of MATH 101 but it cannot be double counted towards the minor.*
- *SAHSS students can count MATH 101 towards the minor.*
- *Students are free to choose electives either from Pure Mathematics or Applied Mathematics or both.*
- *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.*
- *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.*
- *Students must earn a minimum of 20 credits*

Electives offered by the program that fulfil the Math minor requirements:

	Elective Courses
1	MATH 101 Calculus I *(only for SAHSS students)*
2	MATH 104 History of Mathematics
3	MATH 105 The Art of Mathematics
4	MATH 106 Music and Mathematics
5	MATH 113/CS 113 Discrete Mathematics
6	MATH 320/CS 326 Mathematics of Machine Learning
7	MATH 413/CS 413 Graph Theory
8	PHY/MATH 302 Mathematical Methods for Physics

3. Bioscience

Offered by: Integrated Sciences and Math (ISciM) Program

The minor includes courses that build foundational knowledge in Biosciences and expose students to the breadth of sub-disciplines within Biosciences. Hands-on experience, being an integral part of the minor, has been enforced by requiring that students enroll in any companion labs of any taken courses. The structure of the minor further allows the enrolled students to either continue exploring the breadth of Biosciences or develop deeper into the depth of a particular sub-discipline, by offering a choice of courses from various sub-disciplines of Biosciences.

Learning Outcomes

1. Understanding of the fundamental concepts and principles of biology, including genetics, evolution, ecology, and biochemistry.

2. Ability to analyze and interpret data and experimental results in the context of biological research.

3. Familiarity with the current state of knowledge and major research areas in the field of biosciences, including an understanding of the ethical and societal implications of advancements in the field.

Students from all programs at Habib University can pursue the Bioscience Minor.

Requirements for the Bioscience Minor (Class of 2026)

Courses	No. of Courses	Credit Hours	Prerequisite(s)
Foundational Courses			
BIO 101 Cell Biology and Public Health (with lab)	01	03+01	None
BIO 211 Understanding the Human Body (with lab)	01	03+01	None
Electives			
Lower-Level Electives from the list below	02	06 -08	
Upper-Level Electives (300- or 400-level)	01	03-04	
Overall	**05**	**17-20**	

- *Students must take all the foundational courses specified above to qualify for the mathematics minor.*
- **Students are required to take at least one (out of 3) 300 or higher-level electives.*
- *Students must earn a minimum of 17 credits.*
- *Students must earn a C grade or higher in all the foundational courses to continue with the minor.*

Lower-level electives: Students have to take two electives from the following list of courses.

Course code	Course title	Credits	Pre-requisites
BIO 104 + BIO 104L	Ecology & Evolutionary Biology (with lab)	03+01	None
BIO 121 + BIO 121L	Biochemistry (with lab)	03+01	None
BIO 111 + BIO 111L	Food and Nutrition (with lab)	03+01	None
BIO 102 + BIO 102L	The Secret World of Microbes (with lab)	03+01	None
BIO 152	Bioscience in Cinema: Myths and Reality	03	None
BIO 114 + BIO 114	Biodiversity in the City (with lab)	03+01	None

Higher level Elective Courses: Students have to take one (01) elective course from the following.

Course Code	Course title	Credits	Pre-requisites
BIO 301	Global Health and Disease	03	None
3xx/4xx	Cancer, Infectious diseases and Immunology	03	None
3xx/4xx	Independent Study (Research) - Research Projects in Biosciences	03	None

3. Computer Science

Offered by: Computer Science Program

Habib University students from all majors, except for those majoring CS are eligible for the CS minor. Students can double count at most 4 required courses or program electives to fulfill their CS minor requirements.

Requirements for the Computer Science Minor (Class of 2026)

Courses	No. of Courses	Credit Hours	Prerequisite(s)
CS Foundation Courses			
CS 101 Programming Fundamentals	01	02+01	
CS 113 Discrete Mathematics	01	03	
CS 201 Data Structures and Algorithms	01	03+01	
CS Kernel - Any two 200 or higher-level courses from the CS Kernel			
CS Kernel Courses include: • CS 201 Data Structures II • CS 212 Nature of Computation • CS 224 Object Oriented Programming and Design Methodologies • CS 232 Operating Systems • CS 353 Software Engineering • CS 355 Database Systems • CS 412 Algorithms: Design and Analysis	02	06 -08	Pre-requisites for each • CS 102, CS 113 • CS 113 • CS 102 • CS 330 • CS 224, CS 355 • CS 102 • CS 201, CS 212, MATH 310
CS Electives: (Any two courses)			
Electives 200-Level or Higher	02	06-08	
Overall	**07**	**21-26**	

- *Students must take all the foundational courses specified above to qualify for the mathematics minor.*
- **Students are required to take at least one (out of 3) 300 or higher-level electives.*
- *Students must earn a minimum of 17 credits.*
- *Students must earn a C grade or higher in all the foundational courses to continue with the minor.*

4. Electrical and Computer Engineering (ECE)

Offered by: Electrical and Computer Engineering 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

A student successfully completing the minor requirements will be able to:

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

Habib University students from all majors except those majoring in EE & CE are eligible for the ECE Minor. The ECE minor requires successful completion of a minimum of 22 credit hours of coursework and seven (7) courses as described in the table.

Requirements for the Electrical & Computer Engineering Minor (Class of 2026)

Courses	Credit Hours	No. of Courses	Prerequisite(s)/ Corequisite(s)
ECE Core Courses			
EE 100/CE 100 Introduction to Electrical and Computer Engineering[1]	0+02	01	CS 101; EE 112/CE 112
EE 112/CE 112 Electric Circuits – I[2]	02+0	01	EE/CE 100
ENGR 291 Engineering Workshop	0+01	01	None
Any one of the following courses: • EE/CE 213/211 + EE/CE 213L/211L Basic Electronics • EE/CE 172/222 + EE/CE 172L/222L Digital Logic and Design • EE-213[3] Electric Circuits – II + EE-113L[3] Electric Circuits – II Lab • EE/CE 252/251 + EE/CE 252L/251L Signals and Systems	03+01	01	Pre-requisites • EE 112/CE 112 • None • EE 112/CE 112; MATH 201 • MATH 101 Calculus I
Elective Courses			
Two ECE courses (300 level or higher)	02	06-08	
One ECE course (any level)	01	03-04	
Overall	07	22-25	

- *A minimum grade of C+ is required for all four foundation courses.*
- *Only one out of two 300 level courses can also be counted towards student's major.*
- *Up to three courses can be counted towards both the student's major and the ECE minor.*
- *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.*

Equivalent courses prior to Fall 2022:

[1]EE 101 – Introduction to Electrical & Computer Engineering (2-2 credit hours)

[2]EE 111 – Electric Circuit Analysis (3-1 credit hours)

[3]EE 212 – Electric Network Analysis (3-1 credit hours)