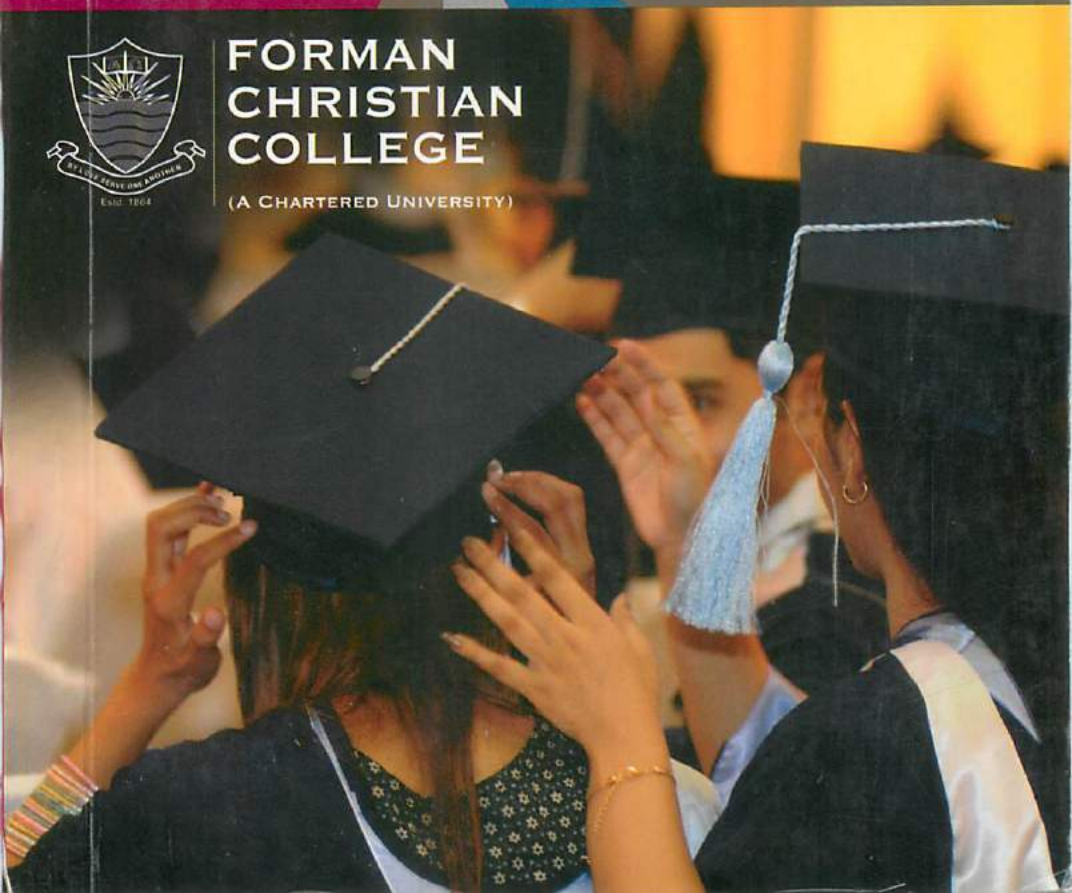
4-Year BACCALAUREATE DEGREE PROGRAM 2012-2013

FORMAN CHRISTIAN COLLEGE

(A CHARTERED UNIVERSITY)



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Message from the Rector

Forman Christian College is a chartered university that offers an American-style 4-year Baccalaureate degree program designed to meet world-class standards. As a private not-for-profit university, our focus is on providing the best possible education for our students. With almost 150 years' history of quality education, FCC has produced graduates who have leadership positions in government, business, education, various professions, religion and arts.

Our high-quality faculty takes personal interest in each student and each student has a member of the faculty to serve as his or her academic advisor. Teaching standards are ensured with an up-to-date curriculum and by bringing in the latest developments in each field.

Located on a beautiful and safe campus with many academic buildings, sports grounds and a swimming pool, we have a rich tradition of providing co-curricular activities through various student societies and sports.

At FCC we are a community of concerned persons who try to live by the core values of the university: integrity, commitment to excellence, discipline, justice, respect and service to community. We are dedicated to living out the college motto, "By love serve one another".

We invite you to be part of the many opportunities for intellectual development and interactive learning; a safe and challenging environment which is conducive to personal growth; a warm and friendly community that makes education a joy; and an educational program that will prepare you well for your career and your role as a citizen.

Cordially
Dr James A Tebbe

Academic Calendar 2012-2013

Fall Semester

26 Sep 2012	Classes Begin
02 Oct 2012	Last Day to Add a Course
12-13 Oct 2012	Competency Exams (Registration 02-03 October 2012)
12 Oct 2012	Senior Comprehensive Exams (Primarily for December Convocation Students)
27-30 Oct 2012	Eid ul Azha (Subject to the Moon)
09 Nov 2012	Iqbal Day Holiday
16 Nov 2012	Last Day to Drop a Course
22-23 Nov 2012	Muharram Holidays (Subject to the Moon)
26 Nov-07 Dec 2012	Mid-Term Exams
01 Dec 2012	Convocation 2012
07-08 Dec 2012	Competency Exams (Registration 27-28 November 2012)
12 Dec 2012	Last Day to Withdraw from a Course
15 Dec 2012	Senior Registration for Spring 2013
22 Dec 2012- 06 Jan 2013	Christmas / New Year / Winter Break
07 Jan 2013	Classes Resume
12 Jan 2013	Junior Registration for Spring 2013
18-19 Jan 2013	Competency Exams (Registration January 08-09,13)
19 Jan 2013	Sophomore Registration for Spring 2013
25 Jan 2013	Last Day of Classes
26 Jan 2013	Freshmen Registration for Spring 2013
28 Jan- 04 Feb 2013	Final Exams
04 Feb 2013	Eid e Milad Holiday (Subject to the Moon)
05 Feb 2013	Kashmir Day Holiday
11 Feb 2013	Grades Due in Academic Office

Spring Semester

08 Feb 2013	Orientation and Registration for New Students
11 Feb 2013	Classes Begin
15 Feb 2013	Last Day to Add a Course
23 Feb 2013	Rising Senior Registration Summer 2013
01-02 Mar 01 2013	Competency Exams (Registration Feb 19–20, 13)
09 Mar 2013	Rising Junior Registration Summer 2013
16 Mar 2013	Rising Sophomore Registration Summer 2013
22 Mar 2013	Last Day to Drop a Course
	Major Declaration Due (Current Sophomores)
23 Mar 2013	Pakistan Day Holiday
15 Mar-09 Apr 2013	Mid-Term Exams
29 Mar-01 Apr 2013	Easter Break
06 & 13 Apr 2013	Senior Comprehensive Exams A
19-20 Apr 2013	Competency Exams (Registration 09-10 Apr 2013)
19 Apr 2013	Last Day to Withdraw From a Course
27 Apr 2013	Rising Senior Registration Fall 2013
01 May 2013	May Day Holiday
04 May 2013	Rising Junior Registration Fall 2013
04, 11 May 2013	Senior Comprehensive Exams B
17-18 May 2013	Competency Exams (Registration 07-08 May 2013)
11 May 2013	Rising Sophomore Registration Fall 2013
24 May 2013	Last Day of Classes
27 May-01 Jun 2013	Final Exams
05 Jun 2013	Senior Grades Due in Academic Office
10 Jun 2012	Grades Due in Academic Office
14 Jun 2013	Honors Convocation Class of 2013
15 Jun 2013	Commencement Class of 2013

Summer Semester

17 Jun 2013	Classes Begin
18 Jun 2013	Last Day to Add a Course
28 Jun 2013	Last Day to Drop a Course
04-05 Jul 2013	Mid-Term Exams
12 Jul 2013	Last Day to Withdraw from a Course
26 Jul 2013	Last Day of Classes
29-30 Jul 2013	Final Exams
05 Aug 2013	Grades Due in Academic Office

1. Introduction to FCC

Brief History

Forman Christian College was founded in 1864 by Dr Charles W Forman, a Presbyterian missionary from the USA. The college was initially known as the Lahore Mission College, but in 1894 the name was officially changed to Forman Christian College (FCC) in honor of the founder. In the early years, degrees were awarded through the Calcutta University. College level instruction was interrupted in 1869 due to the illness of key faculty members. College classes resumed in 1886, with degrees being awarded through the University of the Punjab. In 2004 FCC became a chartered university and from 2009 onwards has awarded its own degrees.

The early years of the college were marked by rapid growth in enrollment, and a constant struggle to find enough space to house the growing college. Enrollment grew from 18 students in 1886 to 130 in 1890, 311 in 1900, 426 in 1910 and 600 in 1915. Enrollment had reached 1,500 students by the time the college was nationalized in 1972. Enrollment today stands at 4,200 students.

The campus was located in the Anarkali (Nila Gumbad) area of Lahore for many years. Four major buildings were constructed by the college on that campus by 1916, and Ewing Hall, built in 1916, is still used as a hostel by the college. In 1940 the college moved to its present spacious campus of over 100 acres on the scenic banks of Lahore Canal.

FCC has been served by a large number of distinguished educational leaders and teachers throughout its history. Dr C W Forman, Dr Sir J C R Ewing, Dr C H Rice, Dr E D Lucas, Dr S K Dutta, Dr H C Velte, Dr J H Orbison, Noble Laureate Dr Arthur Compton, Maulvi Muhammad Bakar, Dr H D Griswold, Prof J M Benade, Shamsul Ulema Maulavi Muhammad Hussain, Dr K C Chatterji, Dr P Carter Speers, Dr S L Sheets, Prof M S Bhatti, Maulana Farzand Ali, Dr R H Ewing, Dr E J Sinclair, Dr Robert F Tebbe and Dr Carl Wheeless are among many who have impacted the lives of students and shaped the future of the college through the years. Under their leadership, the college became widely regarded as one of the very best in the entire subcontinent.

For many decades, FCC has been widely recognized for its meritorious work of nurturing and consolidating the social and intellectual capital of Pakistan. The college motto, "By love serve one another," has been a guiding principle for Formanites throughout the history of the college. Among the graduates of the college are two Presidents of Pakistan, a Prime Minister of India, the first Chief Justice of Pakistan, a number of Governors and Chief Ministers of the Punjab and other provinces, an Attorney General of Pakistan, two Foreign Ministers of Pakistan, a President of the Security Council of the United Nations, numerous Ambassadors to other nations,

a Chairman of the Atomic Energy Commission, a Chairman of the Senate, several Speakers of the National Assembly, numerous Generals and Admirals and an equally impressive list of leaders in the fields of education, law, medicine, arts and entertainment.

FCC has been a leader for the development of curriculum among the universities of Pakistan. Through the years the college introduced into the curriculum such subjects as the Sciences, Economics, Psychology, Geography, Technical Chemistry and Sociology. FCC is the first college in the subcontinent in whose laboratories research work of Nobel Prize caliber was conducted and Dr Arthur Compton received the Nobel Prize in 1932 for research conducted, in large part, at FCC. In 1902, the college was the first college in the Punjab to admit women.

FCC also has a distinguished record of performing service to the nation. At the time of Independence, the college converted two hostels into a hospital for refugees seeking medical assistance and thus began United Christian Hospital. During the Kangra Valley earthquake disaster in 1905, Dr J C R Ewing organized and led the relief effort. Similarly, at the time of the Quetta earthquake in 1935, the college did devoted relief work, this time under the leadership of Prof Jagun Nath. Social service by students was made popular by Prof D J Fleming many years ago.

In 1972 the college was nationalized by the government. It was returned to the present owners of the college on 19 March 2003. In March 2004, the government granted university status to FCC. The college embarked upon an exciting new stage in its history in September 2005 when it began a four-year Baccalaureate (Honors) program designed in accordance with world-class standards for accreditation.

Mission

The Mission of Forman Christian College (A Chartered University) is to impart, create and disseminate knowledge and to develop informed, ethical and responsible citizens who are prepared and committed to learn, lead and serve; persons who exemplify the FCC motto, "By love, serve one another".

Vision

The Vision of the college is to be recognized as one of the very best colleges in the entire subcontinent. This is in keeping with the distinguished reputation established during the first century in the life of the college.

Goals

The educational programs and the faculty approach to teaching are designed to graduate:

Empowered learners with strong written, oral and quantitative skills that they can use to evaluate a constant flood of information. The idea is to create in them the ability to think independently and critically, solve problems and continue a lifetime of self-directed learning.

Informed learners who understand global and cross-cultural relationships, value the philosophy and history underlying the nation of Pakistan, and are fluent in both their native language and English.

Responsible learners who understand the ethical consequences of actions and are well groomed to be active citizens who accept their public duty and participate in the decision making process of a democracy.

Our Commitments

Commitment to Excellence

Forman Christian College (A Chartered University) operates all of its programs in accordance with the highest standards of excellence in education. The educational programs are designed and implemented in accordance with world-class standards of accreditation. The college has begun the process of seeking accreditation with one of the six regional accrediting associations in the USA.

Commitment to Individual Development

FCC is concerned with the development of the whole person, and therefore encourages the intellectual, spiritual, cultural, social, emotional and physical growth of each student. We seek to prepare students for the basic responsibilities of life, and especially for competent and humane leadership and service. The FCC experience is designed to help students go beyond the limitations caused by ignorance, narrowness, conformity, self-centeredness and irresponsibility. Our goal is to help individuals achieve excellence in thought and conduct.

Commitment to Core Values

The faculty and staff of FCC seek to live by, and to teach students, its core values. In a variety of different settings, students are asked to learn and live by the following

values beginning with signing a 'Shared Commitment' document that highlights the practice of the Core Values on a regular basis.

- **Integrity**
  I will speak the truth and keep my commitments. I will take my responsibilities seriously and fulfill them to the best of my ability.

- **Excellence**
  I will be steadfast in my pursuit of excellence. I will set high standards in my intellectual life, personal behavior and interpersonal relationships. I will honor the traditions of the college and preserve the beauty of the campus.

- **Respect for the dignity of each human being**
  I will treat others with respect, kindness, generosity of heart and compassion. I will accept and tolerate differences. I will handle disagreements with candor and civility.

- **Discipline and accountability for my actions**
  I will uphold the policies of the college and follow the rules and regulations. I understand that behavior has consequences. This understanding is an essential component in the development of my self-discipline.

- **Fairness and Justice**
  I will be fair in all of my decisions and work towards justice for others.

- **Service**
  I will live by the college motto, "By Love Serve One Another", knowing that serving others is a way of life that will enrich the community and the nation in which I live.

- **Community**
  I will take the concerns of others in the college community to heart. Because we are bound together by common purpose, objectives and values, the welfare of all will be my concern.

Commitment of Faculty to Students

The faculty of FCC is committed to student learning and to helping students succeed in their studies and be well prepared for a meaningful and productive life after college. Students will form a close personal relationship with one or more members of the faculty, and this close student-faculty contact has been one of the strengths of FCC throughout its history. Faculty members provide assistance to students, as needed, outside of the classroom, and they do not charge tuition for this help. Indeed, their contract with the College prohibits faculty members from charging tuition for extra assistance.

Commitment to General Education

While FCC is committed to helping students develop competence in a specific field, it is equally committed to general education. The general education program is designed to provide a foundation for lifelong learning by helping students to develop a love of learning. It prepares students for responsible citizenship by teaching them the lessons of history, by creating awareness of their cultural heritage, by helping them understand the causes of social and political unrest, and the conditions for stable governance and sustainable economic development. Through studies in the humanities, the general education program seeks to help students explore various perspectives on the central concerns of human existence.

The general education program is designed to help students to assume increased responsibility for their own growth, to master the skills that are necessary to understand and deal with a rapidly changing and increasingly complex world. The general education program requires students to take three courses in each of the following areas of human knowledge: Natural and Physical Sciences, Humanities, Social Sciences, and Computer Science/Mathematics. Four courses are required in Communications.

Commitment to Career Preparation

Enriched with the Enduring Qualities of a Liberal Arts Education FCC seeks to graduate students who are well prepared for success in a career. Through the major field of study selected by the student, he or she will receive a basic knowledge of a particular field in enough depth to be successful in entry level positions in a career and to advance successfully to increased levels of responsibility on the job. However, it is impossible to predict what a person will need to know for success on the job twenty years from now, but we do know that in most jobs new knowledge will have to be mastered that does not even exist today. Therefore, it is more important to learn how to learn, how to think, how to solve problems, and how to communicate effectively rather than just to focus narrowly on the content of an academic discipline. The educational program is designed to help students develop these skills.

Commitment to Coeducation

The Baccalaureate Degree Program of FCC is co-educational. FCC first admitted women in 1902, and it seeks to provide a learning environment in which both men and women can learn effectively and develop the character traits and personality that will enable them to succeed in later life. The core value of respect for the dignity of each human being is also an important consideration for creating a wholesome and positive atmosphere for learning by both men and women.

Commitment to Lifelong Learning

FCC seeks to prepare students for a lifetime of self-directed learning. This will be essential for success in a rapidly changing and increasingly complex world. The faculty models this commitment by constantly learning about new knowledge in their academic discipline, and by participation in a variety of professional development programs presented to them by the university management to help them learn new approaches to teaching and learning.

Commitment to Providing an American-style Education

The proceeding commitments reflect the commitment to provide an American-style education. The American system of higher education is widely recognized as the very best in the world and we seek no less than the best for Pakistan. This commitment is an approach to education rather than a statement about the specific content of the curriculum. At Forman Christian College the role of the faculty and the students, the balance between the breadth and the depth of learning (General Education and a major field of study) and the structure of the program reflect best practices in American higher education.

Commitment to Equality of Opportunity

At Forman Christian College students, faculty and staff are free within the university from all forms of discrimination based upon gender, race, age, ethnicity, nationality, religion or physical disability. Decisions regarding employment and admission to the university are based upon merit. Grades in courses and graduation from the university are based upon the performance of the student in meeting course and graduation requirements. These standards will be implemented without discrimination on the basis of gender, race, age, ethnicity, nationality, religion or physical disability.

Financial Integrity

FCC is a private, not-for-profit education institution. All tuition and fee income goes directly to the support of the educational program. Indeed, tuition and fees pay only a portion (approximately 73%) of the educational costs per student. Thanks to the support of donors, the balance of costs is paid from endowment income and gift income from individuals, churches, corporations and foundations.

2. Campus

Forman Christian College has an impressive and well-maintained campus with all the facilities needed to create an environment that is truly academic and conducive to purposeful learning. Centrally located in a beautiful residential area of Lahore, the campus sprawls over 108 acres along the left bank of the canal.

There are two new purpose-built buildings for university students. Inaugurated in 2007, the Elahi Building houses the Social Science disciplines including the Departments of Business Management and Economics. The Armacost Building is a modern state-of-the-art science building for the Departments of Biological Sciences, Chemistry, Physics and Computer Studies/Information Technology. It was inaugurated in February 2010.

In addition to administrative offices, the Ahmed Saeed Administration Building (former N Block) houses computer labs for the use of Baccalaureate students, as well as classrooms for language studies.

The Lucas Centre contains the Canteen which offers a setting for students to relax between classes. Basketball courts, a gymnasium, badminton and table tennis facilities are also located in Lucas Centre as are the offices of the Health & Physical Education Department.

Sinclair Hall houses the largest auditorium - seating 740 people - of the university. This is where major events including the annual honor's convocation, annual play, Christmas pageant, etc. are held.

FCC has a large sports ground in the centre of campus that includes facilities for cricket, football and hockey plus a 400-meter oval shaped running track. A modern 25-meter swimming pool and six tennis courts are also located on campus.

Five student hostels are located on campus and an additional hostel, Ewing Hall, is located in the Anarkali (Nila Gumbad) area of Lahore. The hostels located on campus are Griswold, Kennedy, Newton, Velte and West Halls for male students and Shirazi Hall for female students. Each of the men's hostels provides rooms for approximately 90 students plus a common room and a mess hall. Almost all of the student rooms are single cubicles for only one student, but they are arranged so that three rooms share a verandah. Shirazi Hall provides accommodation to 108 women. Currently a new hostel for female students is being constructed next to Shirazi Hall and will have accommodation for 374 residents.

Learning is not restricted to the classrooms and many of the most important lessons learned during the college years are learned through participation in co-curricular and sports programs. FCC offers a great variety of programs that provide opportunities for students to participate in activities that contribute to their learning and enjoyment.

3. Student Life

Co-Curricular

Forman Christian College is committed to providing a holistic education. Classroom learning is supplemented by opportunities for students' intellectual and moral growth through carefully planned literary, academic, cultural and recreational activities and programs. The Office of Student Affairs coordinates and promotes activities of all the existing student societies, and almost every academic department has a student society. Currently there are over 35 student societies. Each society plans and conducts programs during the year that enrich the learning experiences of students and provide opportunities for student leadership.

Student societies have their own website: www.fccsocieties.org. The following societies are currently functioning:

Art Junction
Bazm-e-Fikr-o-Nazar
Benade Physics Society
Christian Life Program
Dean Geography Club and Adventure Society
EarthWatch Club
English Club
Ewing Literary Society
Folio
Forman Biology Society
Formanites Debating Society
Forman Dramatics Club
Formanites Education Society
Formanites Journalism Society
Forman Model United Nations Society
Forman Music Society
Forman Photographic Society
Forman Political Science Society
Forman Psychological Society
Forman Sociological Association
Forman Statistics Society
Griswold History Society
Islamic Society
International Affairs Society
Leadership Forum
Lucas Economics Society
Mathematics Society
Philosophy Society
Red Crescent Youth Group
Rotaract Club
Speers Chemical Society
Women's Club

Residential

Students who come from outside of Lahore can avail the facilities of FCC's hostels. For male Baccalaureate students, West Hall on-campus and Ewing Hall in downtown Lahore, together provide accommodation for almost 200 residents. FCC also has Shirazi Hall, an on-campus hostel for over 100 female students. A new hostel, with accommodation for 374 female students, is under construction and should be completed by fall 2014. The hostels provide students with facilities for healthy and comfortable living, together with a common room in each hostel for recreation. Meals are served at fixed times in the dining hall of each hostel. Each hostel has two faculty members, a Warden and an Assistant Warden, who live in the hostel and supervise the quality of student life.

Religious Life

As a college, we are concerned with teaching values and building strong positive character traits and discipline in our students. For Christian students we offer regular chapel programs, regular Bible study groups and opportunities for volunteer service. For Muslim students we convene Dars-e-Quran classes together with symposiums and discussions to which eminent Muslim scholars are invited to deliver talks and/or to engage students in discussions on important religious, social and moral issues.

Sports

FCC has a College Sports Board that organizes, promotes and conducts games. The College Sports Board features a very active intramural sports program with competition in athletics, basketball, cricket, football, hockey, table tennis, wrestling, lawn tennis and swimming. Participation in intervarsity competitions in many of these sports is part of the sports program.

Canteens

Student-faculty-staff social interaction in a more relaxed setting takes place at the Canteen in Lucas Centre and at the open air café. The faculty is available to assist students outside the class, and the Canteen is occasionally an appropriate setting for this interaction. More typically, it is simply a place for students to go for lunch or snacks between classes.

Health Services

The college operates a small dispensary in Lucas Centre and has an on-going relationship with the nearby United Christian Hospital for cases that require specialized attention.

Counseling

The University Counseling Center is a facility to help students deal with problems which they may not want to discuss with family, friends or their teachers. The Center provides individual and confidential counseling and may refer students to other professionals if needed. The Center does not deal with issues related to academic advising, but with personal and emotional issues that students face in their lives.

Discipline

All students are expected to act with dignity and self-respect, to be honest, considerate, well-behaved and courteous. Moreover, Students must observe strict disciplinary standards. The order of the Rector in all disciplinary matters shall be final and legally binding on all students. Proctors will maintain discipline, enforce rules of good conduct and take disciplinary action against students wherever required.

- Students are required to observe rules/regulations governing their studies (both theory & practical) as may be made from time to time.
- Students are expected to attend every lecture and laboratory session of classes in which they are enrolled.
- Acts of dishonesty and cheating specially during examinations are strictly prohibited.
- Students are required to abstain from undesirable behavior that poses a threat to any fellow student, faculty or staff member or any other person working as an employee of the college. Behavior that disrupts the normal flow of academic work or co-curricular activities is prohibited.
- Destruction, defacement or damage caused to college property shall be severely dealt with.

The following are strictly forbidden at the college campus

- Possession, use or consumption of alcoholic beverages
- Hard liquor or drugs
- Weapons of any kind
- Cigarette smoking within the college premises

Dress Code

The purpose of the FCC dress code is to ensure that our students are dressed in a graceful manner. This means that the clothing worn will be clean, neat, modest and reflective of the culture in which we are operating. The dress code is to be worn by all University students in the academic areas of campus during academic hours.

The following applies to all clothing worn by men or women on campus:

- FCC ID cards must be visibly displayed at all times on campus
- Cothes should be clean and pressed
- They should not be see through
- No tight clothing
- No holes or torn/frayed areas
- No offensive or obscene writing
- No sleeveless shirts

Acceptable attire for university students is as follows:

For male students

- Shirt with collar
- Pants long (no low riders)
- Ties optional
- Shoes should be clean and well cared for (no chappals)
- Shalwar kameez may be worn on Friday. NO shawls/chadars may be worn.

For female students

- Knee-length or longer shirt
- Shalwar or pants of any type should cover the ankles
- Dupatta or shawl
- Scarf can be worn in winter with a sweater or jacket
- Clean and well-cared for shoes

4. Admissions

Forman Christian College seeks academically qualified students who link academic seriousness with the potential for, and a commitment to, leadership and service to local community, province and nation. We seek students who are highly motivated to making a contribution to solve the problems of our society; those who have demonstrated behaviors that indicate a sense of social responsibility rather than pursuit of narrow self-interest.

The following will be considered for admission

- Students who have passed the Intermediate examination within the preceding two years and secured 60% marks.
- Students who have passed the A Level examination within the preceding two years and secured a C average.
- Students who have passed the American High School Diploma within the preceding two years and secured a C average.
- Students who have passed the International Baccalaureate within the preceding two years and secured a C average.

Students can apply for admission on the basis of open merit, minority, or both.

Application Procedure

- Collect the application forms from the Accounts Office.
- Complete and return the application to the Admissions Office.
- Appear for the Forman Entrance Admission Test (FEAT Accuplacer).
- Attach the photocopy of the result card and character certificate from the institution last attended.
- Watch for the admissions notices which will appear on the university website www.fccollege.edu.pk

FEAT Accuplacer

The FEAT (Forman Entrance Admissions Test) is required to be taken by all students applying for university admission to the BA (Hons), BSc (Hons), BSc (Hons) Computing and BSc (Hons) Business programs. It consists of three tests: ESL Language Use (grammar), ESL Reading Skills, and Arithmetic (whole numbers and fractions, decimals and percents, applications and problem solving). Satisfactory performance on the FEAT is necessary for admission. Scores will also partially be used to determine placement in English and Mathematics courses.

Tuition Fees

For the academic year 2012-2013, all applicants to the Baccalaureate program must pay a non-refundable application fee of Rs 8,000 at the time of admission. Candidates are

also required to make a security deposit of Rs 10,000 which is refundable when they graduate. This amount is also refunded should he/she decide not to enroll at FCC.

Tuition and fees for the academic year 2012-2013 are:

BA (Hons)/BSc (Hons)	Rs 56,000/semester	Rs 112,000/year
BSc (Hons) Business	Rs 99,900/semester	Rs 199,800/year
BSc (Hons) Computing	Rs 76,700/semester	Rs 153,700/year

All tuition and fees must be paid on the date specified by the university. If a student fails to pay the required amount by the specified date, he or she will be fined Rs 50 per day. Students whose fees remain in arrears for two months will be dropped from the university rolls and will have to pay a readmission fee of Rs 500 in addition to the full payment of all outstanding tuition and fees. Tuition and fees once paid are not refundable except in very unusual circumstances.

Tuition fees for a withdrawn semester will be prorated as:

- Withdrawing before the start of the semester or the week of add/drop → Full refund, no charge
- Withdrawing during the first month of the semester (excluding the week of add/drop) → 75% refund, 25% charge
- Withdrawing during the second month of the semester → 50% refund, 50% charge
- Withdrawing during the third month of the semester → 25% refund, 75% charge
- Withdrawing after third month of semester → No refund, full charge

Hostel Charges

Hostel expenses for the academic year 2012-2013 are as follows:

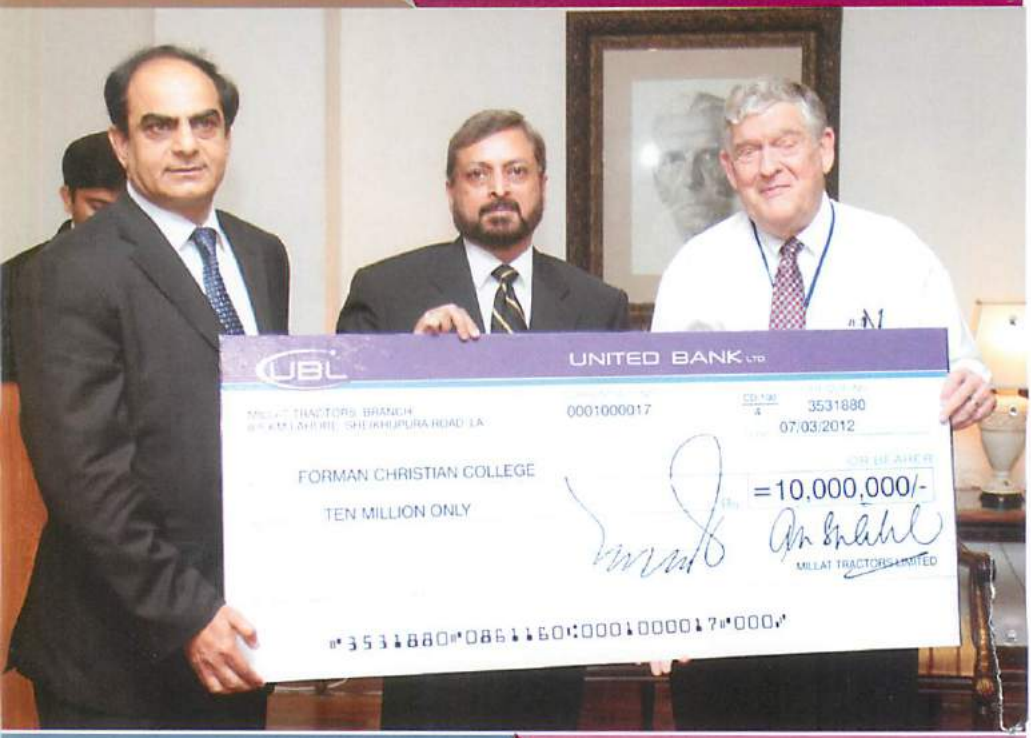
- Single Occupancy: Rs 47,600
- Double Occupancy: Rs 38,300
- Triple Occupancy: Rs 36,000
- Quadruple Occupancy: Rs 31,300

The hostel annual occupancy fee is payable in two equal installments, 50% at the time of admission and the remaining 50% three months after payment of the first installment. The occupancy fee is not refundable if the student leaves during the academic year.

A refundable security: of Rs 10,000 must be paid by newly admitted students. Monthly charges including mess, utilities and services vary depending on the monthly bills, and are in addition to hostel charges.

All dues are to be paid in the Accounts Office.

5. Financial Assistance



Merit Scholarships

Merit scholarships, amounting to a 75% fee waiver, are awarded to FCC students entering as Freshmen in the Baccalaureate programs for the year 2012-2013 according to the criteria below. The decision to award a merit scholarship is taken by the Scholarship Committee which comprises the Registrar and Executive Vice Rector.

Students who have given the Intermediate examinations should

- obtain 85% marks or higher in the 1st year Intermediate exams
- AND pass the FEAT
- AND maintain a minimum of 85% aggregate marks after 2nd year exams

Students coming after the 2nd year results are announced or who did not have 85% in their 1st year but improve to 85% aggregate after the 2nd year result, are eligible for the scholarships if any are still available.

Students who have done A Levels should have

- 3 or more As in A Level exams in relevant subjects (i.e. those A Level subjects for which FCC will give credit)
- AND passed the FEAT

Students having a High School Diploma or who have done the International Baccalaureate need

- a positive evaluation by the Scholarship Committee based on the student's GPA
- AND to pass the FEAT

Scholarships are awarded on a first-come-first-served basis, i.e. the first students who qualify with the criteria above and take roll numbers. To continue to receive this scholarship, all beneficiaries must be full time students and maintain a minimum 2.0 CGPA. Students obtaining 75% fee waiver can also apply for need-based financial aid.

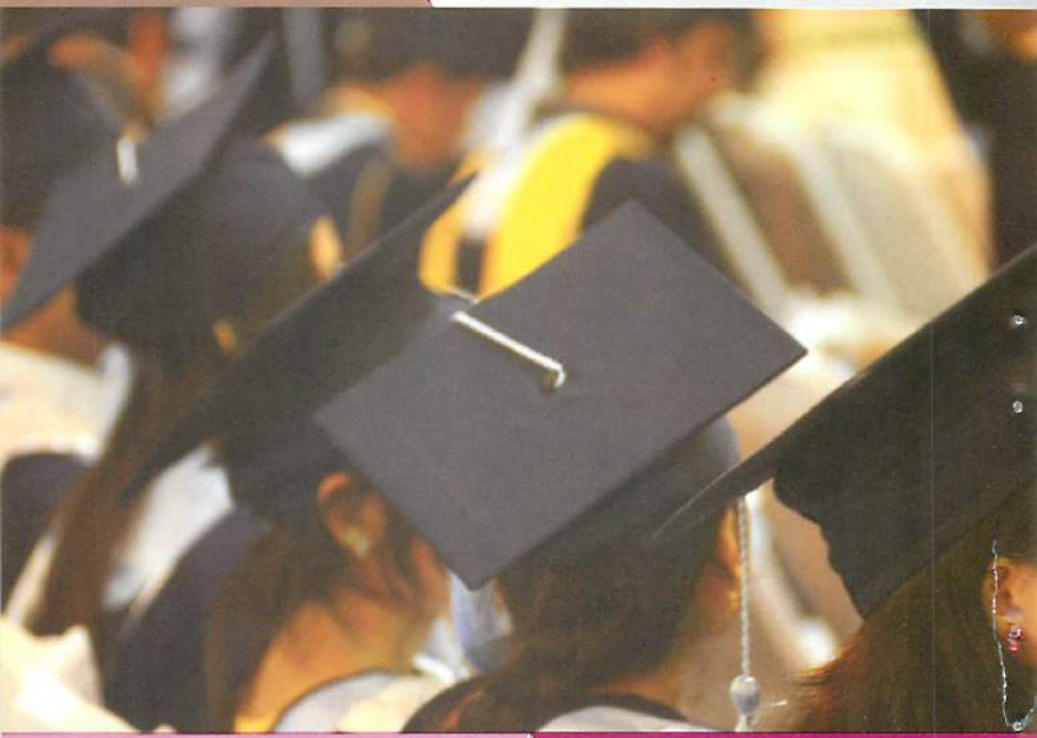
Need-Based Financial Aid

Forman Christian College believes that deserving, qualified students should not give up their dream of an education because of financial needs. FCC, therefore, dedicates a significant portion of its budget each year to providing need-based financial assistance to needy and academically eligible students. These financial assistance awards are on a non-discriminatory, equal opportunity basis

Application Procedure

Admitted candidates may apply for financial assistance by completing the financial assistance form and accompanying required documents. This form is submitted to the Financial Assistance Office. The Director Financial Assistance will award the financial assistance to deserving students, in consultation with the Rector.

Academic Policies



Medium of Instruction

At FCC the medium of instruction is English. Students entering the Baccalaureate program with deficiencies in English language skills will be required to enroll in English Language courses designed to help such students succeed.

Grading System

The standard grading system of the university is A (Superior Work), B (Good Work), C (Satisfactory Work), D (Poor Work) and F (Unacceptable Work). All courses in which a grade of C or higher has been earned shall count toward fulfilling degree requirements. A course in which a D grade is earned may fulfill degree requirements only when a grade of B or higher is earned in another full course.

The student's Grade Point Average (GPA) is computed on the basis of awarding 4.0 quality points for a grade of A; 3.0 quality points for a grade of B; 2.0 quality points for a degree of C; 1.0 quality points for a grade of D; and 0 quality points for a grade of F. The student must earn a Cumulative Grade Point Average of 2.00 or better in order to graduate.

Grade Change Policy

If an instructor of a student determines that a grade was issued incorrectly because of a clerical or procedural error (a calculation error or one in transcribing the grade), it can be corrected by submitting a grade change form to the Academic office.

The procedure is as follows:

1. An original grade change form must be picked up from the Academic Office by only an Instructor of the course for which the change is being made.
   a. Forms will not be given to the student requesting the grade change or department administrative staff.
   b. Grade Change forms must not be stored in excess by instructors/departments.

2. The grade change form must be filled completely:
   a. The reason for the change must be stated clearly.
   b. The form must be signed and dated by the instructor.
   c. If the instructor is no longer on faculty, the grade change form can be processed by the department Chairperson or Dean with approval from the Vice Rector.

3. All grade changes carry a time limit.
   a. Incompletes can be changed within 8 weeks of the following semester.
   b. Any other changes (due to typing errors and miscalculations) will continue to be accepted by the Academic Office up to 8 weeks of the following semester.
   c. After this time grades cannot be changed except for Incompletes.
   d. Approval of the Vice Rector is required for submission of grade changes beyond the stated time.

4. The grade change form must be submitted in person by the Instructor within the stated time frame. Only original forms will be accepted for grade change. Photocopied grade change forms will not be approved.

Grade of 'I' (Incomplete)

1. A grade of "I" (Incomplete) indicates that, although a substantial proportion of the course requirements have been met, the student has not completed all course requirements by the end of the term.

2. In the judgment of the instructor the student:
   a. Has been in good standing.
   b. Is facing an emergency situation beyond his/her control.

3. A student must submit the work required within six weeks of the following semester. If the work is not completed the grade of incomplete is automatically changed to an F.

4. An Incomplete should never be given to a student who has performed poorly during the entire semester and wants extra time to improve the grade.

Retake & Withdrawal Policies

Retaking a Course

Students who have received a grade of D or F in a course are allowed to retake that course. The second grade will count and will be factored into the CGPA.

Course Withdrawal

Students are allowed to withdraw from a course until the end of the ninth week of the semester. Students who withdraw from a course by the withdrawal deadline will receive a grade of WP or WF by the instructor.

If a student does not officially drop a course or withdraws from a course after the deadline, he/she will receive a grade of F.

In extreme circumstances beyond the student's control, such as illness, accident or death of a parent, permission will be granted to withdraw after the withdrawal deadline. The student may request an emergency withdrawal by submitting a petition (and attaching appropriate documentation) to the Assistant Vice Rector.

Temporary Withdrawal (Discontinuing for one semester or year)

A Temporary Withdrawal means the student has decided to discontinue one semester or one year of studies. Depending on the date of withdrawal, the student may be entitled to a refund. Please refer to the withdrawal refund policy in the catalog.

Students who need to withdraw should initiate the process by meeting first with their mentor and then with the Dean of Students, completing the withdrawal form and providing appropriate documentation to support their request to withdraw.

Students who are recipients of financial aid must consult the Office of Financial Aid to confirm if their withdrawal will have any impact on their financial aid eligibility.

The Dean of Students will forward the withdrawal form along with documents to the Assistant Vice Rector as soon as the decision to withdraw has been made.

One Course in Lieu of Another

If during the course of a student's four year program, the department decides to change core course offerings by:

1. Withdrawing a core course that was required in a catalog
2. Offering one course in lieu of another

The department must:

1. Inform the Vice Rector officially and copy the Academic Office on such a change being made and its applicability to all students.
2. Get the approval of the Vice Rector prior to making an exception for one student.

University Withdrawal

A University Withdrawal is defined as leaving the university permanently. If a student decides to leave the university the procedure to be followed is given below:

1. The student must go to the Academic Office for an official university *Student Clearance Form.*
2. It is the student's responsibility to obtain clearance from the Library, Computer Lab, Chief Proctor, Accounts Office and Science Laboratories.
3. The university ID card must be returned to the Chief Proctor.
4. The student's letter of discontinuation along with the clearance form must be submitted to the Academic office for the Assistant Vice Rector's approval.

5. On receiving the approval, the Academic Office will issue a *Letter of Release.*
6. The student must submit a copy of the *Letter of Release* to the Accounts office in order to collect his/her library security deposit.
7. If a student quits and fails to inform the university about the decision to discontinue at the university, he/she will receive failing grades for all courses. If the student does not cancel his/her registration prior to the drop deadline, he/she will be held financially responsible for applicable tuition fees.

Readmission to the University

Students who have not been enrolled for *three* consecutive semesters will be dropped from the university. They must seek readmission to the University to resume their studies by submitting a *Request of Readmission* to the Vice Rector for final approval. It is the student's responsibility to submit a copy of the readmission approval to

1. the Accounts Office (for Readmission fee and tuition) and
2. the Academic Office (for Registration).

Once readmitted the student will apply for student ID card at the Chief Proctor's office.

Academic Credit

Credit towards a degree is awarded for satisfactory course completion, independent study or academic work certified by another accredited degree granting institution.

A credit hour identifies a contact hour which a student has to attend in class work, or two contact hours a student has to attend in the laboratory, studio or field work each week in a regular semester. Thus, a three credit course will meet for three hours per week, or two hours of lecture and two hours of laboratory per week.

Ordinarily credit is earned by course completion. A normal full-time academic load is five courses (15 credit hours) per semester. A student may take a minimum of 12 semester credit hours or a maximum of 18 semester credit hours and still be considered a full time student. If a student enrolls in fewer than 12 credit hours, he/she is considered to be a part-time student. Enrollment of more than 18 hours is very rare and requires the approval of the Advisor and the payment of additional tuition fee.

Credit may be earned through independent study by advanced students who exhibit both the self-discipline and mastery of the methods demanded by the subject matter selected by the student. An independent study project is designed by a student in consultation with the professor who is to supervise and evaluate the work. An academic contract, made in advance, specifies the subject and method of inquiry, the texts, the purpose of the project, and the basis of evaluation and credit. Each contract must be approved by the Vice Rector. Independent study forms are available from the Office of the Assistant Vice Rector.

Credit is earned by migration or transfer from another degree-granting institution recognized by the Higher Education Commission or accredited in the USA or UK, up to a limit of 64 credit hours. A student transferring to FCC from another institution should request a transcript of work done in the other institution be sent to the Assistant Vice Rector. When the transcript has been evaluated, the applicant is notified of the credit acceptance by migration/transfer committee.

FCC recognizes that many experiences outside the classroom may contribute to a student's program. Internships, participation in community projects, and field experience may be accorded credit if closely coordinated with the student's academic program. Such experience ordinarily constitutes a part of a regular course or independent study project.

Transfer Credit

Course Credit that is Acceptable

1. An official request for transfer of credits takes place through:
   a. The Vice Rector's Office prior to a new admission
   b. The Academic office for students going on student exchange programs during their course of study at Forman Christian College
2. An official transcript is required for all transfer work.
3. The student must have a letter of good academic standing from the University he/she is leaving.
4. The transfer courses must come from an accredited institution.
5. The courses must be appropriate for Forman Christian College's Degree Requirements.
6. The grade for each course must be a C or better to be accepted by Forman Christian College.
7. The Chairperson of an individual department determines how transfer credits count toward the fulfillment of Forman Christian College's Major Degree requirements.
8. Transfer of General Education requirements is determined by the Academic Office.

Course Credit that is Unacceptable

1. Transfer credit request based on unofficial or photocopied transcripts
2. Courses studied at Non-accredited institutions

Registration

Registration dates are published in the academic calendar. Upon completion of the registration procedures as outlined in the registration materials provided by the office of the Assistant Vice Rector, the student's registration is approved by the Accounts Department and the Assistant Vice Rector.

All courses for which the student wishes to register for credit must be registered through the student web services. The student is responsible for every course listed on his/her account schedule and can receive no credit for courses not listed here. After registration, official changes in registration may be made only during official add/drop periods when access to registration is again available. Unless a course is officially dropped, a grade of F will be assigned if the student fails to meet the obligations of the course. No course may be added after the drop/add deadline.

Cancellation of Courses

Courses may occasionally be cancelled because of low enrollment; however, if a course is cancelled, students will be notified in advance and assisted in arranging a satisfactory substitute.

Degree Requirements

BA (Hons) Degree

The following requirements must be fulfilled by all students in order to qualify for formal recommendation by the faculty for the BA(Hons) Degree:

1. The satisfactory completion of 130 credit hours with a cumulative grade point average (CGPA) of 2.0 or better as well as a grade point average (GPA) of 2.0 in the major.
2. The completion of at least 12 upper level courses labeled at the 300 or 400 level.
3. The satisfactory completion of a major field of study from a list of those offered by the university and specific to one catalog only. For the BA (Hons) degree at least 36 credit hours (including core courses) must be completed as stated in the requirements of the selected major.
4. The satisfactory completion of the General Education requirements of the university.
5. The passing of the Comprehensive examination in the major field of study.
6. The passing of the five competency exams as required by the university.

BSc (Hons) Degree

The following requirements must be fulfilled by all students in order to qualify for formal recommendation by the faculty for the BSc (Hons) Degree:

1. The satisfactory completion of 130 credit hours with a cumulative grade point average (CGPA) of 2.0 or better as well as a grade point average (GPA) of 2.0 in the major.
2. The completion of at least 12 upper level courses labeled at the 300 or 400 level.
3. The satisfactory completion of a major field of study from a list of those offered by the university and specific to one catalog only. For the BSc (Hons) degree at least 48 credit hours (including core courses) must be completed as stated in the requirements of the selected major.

4. The satisfactory completion of the General Education requirements of the university.
5. The passing of the Comprehensive examination in the major field of study.
6. The passing of the five competency exams as required by the university.

BSc (Hons) Business

The following requirements must be fulfilled by all students in order to qualify for formal recommendation by the faculty for the BSc (Hons) in Business Degree:

1. The satisfactory completion of 130 credit hours with a cumulative grade point average (CGPA) of 2.0 or better as well as a grade point average (GPA) of 2.0 in the major.
2. The completion of at least 12 upper level courses labeled at the 300 or 400 level.
3. The satisfactory completion of a major field of study in Business from a list of those offered by the department and specific to one catalog only. For the BSc (Hons) Business degree at least 64 credit hours (including core courses) must be completed as stated in the requirements of the selected major.
4. The satisfactory completion of the General Education requirements of the university.
5. The passing of the Comprehensive examination in the major field of study.
6. The passing of the five competency exams as required by the university.

BSc (Hons) Computing

The following requirements must be fulfilled by all students in order to qualify for formal recommendation by the faculty for the BSc (Hons) in Computing Degree:

1. The satisfactory completion of 130 credit hours with a cumulative grade point average (CGPA) of 2.0 or better as well as a grade point average (GPA) of 2.0 in the major.
2. The completion of at least 12 upper level courses labeled at the 300 or 400 level.
3. The satisfactory completion of a major field of study in Computer Science (CS), Information Technology (IT) or Software Engineering (SE) and specific to one catalog only. For the BSc (Hons) in Computing degree at least 64 credit hours (including core courses) must be completed as stated in the requirements of the selected major.
4. The satisfactory completion of the General Education requirements of the university.
5. The passing of the Comprehensive examination in the major field of study.
6. The passing of the five competency exams as required by the university.

General Education

Distribution Requirement

The General Education requirement introduces students to a broad range of intellectual pursuits, to provide sufficient breadth of knowledge to prepare them for their role as

citizens, to equip them with communication and analytical skills, to help them to integrate knowledge that comes from different disciplines and to prepare them for a lifetime of self-directed learning. There are two components of the General Education requirement. First, students must take a total of 47 credit hours taken through courses in each of the four general divisions of the academic program. Second, by the end of the second year, students must demonstrate competency as determined by performance on college assessment examinations in the following five areas:

1. Written communication in Urdu
2. Written communication in English
3. Oral communication in English
4. Quantitative skills
5. Information technology

Students must complete the designated number of credit hours in each of the four divisions of the curriculum listed below.

Courses	Number of courses	Credit hours
1. Humanities	6	**18**
a. Written and Oral Communications	4	12
b. Islamic Studies/Ethics	1	3
c. Humanities and Arts	1	3
2. Social or Behavioral Sciences	**3**	**9**
a. Pakistan Studies	1	3
b. Other Social Science or Behavioral Sciences courses	2	6
3. Science and Mathematics	**5**	**17 or 18**
a. Must include at least two science courses (Not from the same discipline)	2	8
b. Must include at least one Mathematics course	1	3
c. Must include at least one Computer Science course	1	3
d. One other course in either Science, Maths, Statistics, Logic or Computer Science	1	3 or 4
4. University 100: Foundation of University Education	**1**	3 or 4
Total	**15**	**47 or 48**

Humanities: 6 Courses = 18 Credits
All students must complete the following three courses in Written Communication and one in Oral Communication.

Written Communication:
English 101: Writing and Grammar, English 103: Advanced Writing Skills, Urdu 101: Communicative Urdu

Oral Communication:
Mass Communication 100: Fundamentals of Speech

Students who believe that they have the knowledge and skills necessary to pass the Competency examinations in written Urdu or written or spoken English may take the competency examinations at the beginning of the Freshman year. If they pass the competency examinations they will be exempted from the relevant specific required course and they may, instead, take advanced courses in those areas.

A student must take **ONE** course in Islamic Studies/Ethics plus **ONE** course selected from the following disciplines: English, Urdu, History, Religious Studies, Philosophy, Foreign Languages, Art, Music, Drama and Mass Communication.

Social and Behavioral Sciences: 3 Courses = 9 Credits
A student must take **ONE** Pakistan Studies course and at least, **TWO** courses from the following disciplines: Economics, Education, Geography, Pakistan Studies, Political Science, Anthropology, Psychology and Sociology.

Science and Mathematics: 5 Courses = 17 or 18 Credits
Students must take

1. At least **TWO** Science courses (Not from the same discipline): **Physical Science** - Chemistry, Physics/ **Natural Science** - Zoology, Biotechnology, Environmental Sciences, Biological Science, Botany
2. At least **ONE** Mathematics course
3. At least **ONE** Computer Science course
4. **ONE** other course in either Science, Math, Statistics, Logic or Computer Science

University 100: Foundation of University Education (1 Course = 3 Credits)

1. Prerequisite Language 110 (or exempted from the Language Program).
2. All entering students must take University 100 during their first semester or after they have finished the Language program. Transfers with 60 or more credits are exempted.

English Language Courses

For all students entering the baccalaureate program with deficient English skills, a special immersion program has been developed.

1. All entering students will take ACCUPLACER for course placement. Students who do well will be placed into ENGL 101 or ENGL 103. Students with low scores will be placed into LANG and will need to clear the LANG final exam (ACCUPLACER and Spoken Test) as a prerequisite for ENGL 101. Promotion is determined by performance on the final exam (ACCUPLACER and Spoken Test) and is not based on the course grade.
2. Number of credits per semester:
   a. LANG 100 students can only take 12 credits of LANG and 3 credits of Urdu.
   b. LANG 110 students can only take 12 credits of LANG and 3-4 credits in one other course.
3. Students can repeat LANG courses, but can only receive credit once for LANG 100 or LANG 110. FCCU students are required to pass Spoken English and Written English competency exams to graduate so mastering English is vital. Continuing to learn English until a student is proficient, even if no credit is earned for follow up courses, is important for success in the baccalaureate honors program at Forman Christian College. Furthermore, English is the international language of business and commerce, so developing proficiency in English will enable success in life far beyond the campus of FCC.

This is to equip students with enough skills in the English language to manage the rigors of academic work at FCC.

Majors and Minors

Majors and Areas of Concentration

Students must complete the requirements of a major field of study in order to graduate. The number of credit hours required for the major varies depending upon the degree selected by the student, but it will be no fewer than 36 credit hours and no more than 64 credit hours. There are 24 different majors offered at FCC and brief descriptions of the course offerings and the specific courses required for each major are included under every discipline heading in the course description section of this catalogue.

Majors are offered in Biological Sciences, Business, Chemistry, Computer Science, Information Technology, Economics, Education, English, Geography, History, Pakistan Studies, Religious Studies, Mass Communication (Journalism), Mathematics, Physics, Psychology, Political Science, Sociology, Statistics, Urdu, Philosophy, Software Engineering, Environmental Sciences and Biotechnology.

Requirements for Minor

In order to minor in a particular discipline, the student must complete ½ of the credits required for a major in that discipline. The specific courses required for a minor are determined by each department and are available in the Baccalaureate catalogue and from the Chairperson of the department.

Change of Program

1. A student's request to change his/her program of study will be reviewed by the Dean and department Chairperson of the program the student wishes to enter. Decisions made by the Dean and department Chairperson are final. They will notify the Academic Office of their decision to allow the student to enter another program.
2. The fee structure will be changed in accordance with the new program.
3. The student will transfer into the requested program in the next semester.

Counting a Conventional Degree towards a 4-Year Baccalaureate

1. A petition for conversion must be submitted to the Vice Rectors office.
2. The transcript or result of the accredited university's conventional BA/BSc degree must be submitted with this petition.
3. The Vice Rector will make a merit-based decision on the petition and communicate this in writing to the student.
4. If the petition is approved, the conditions of transfer apply.
5. A minimum of 30 credit hours can be achieved through transfer at Forman.

Academic Progress

Standards of Academic Progress

Forman Christian College has high standards for student performance because we believe that performing at an excellent level in course work is good preparation for leadership opportunities following College. We ask our students to do their very best and we will monitor student performance to help them be aware if a problem is developing.

Normal progress toward graduation is the completion of five courses each semester with a grade of C or better.

Academic Review

At the close of each semester the Academic Review Committee reviews the progress of every student who fails a course, receives a voluntary withdrawal (W), has more D grades than B or better grades, is on academic probation, or is otherwise identified as

not making satisfactory progress. The Committee may place on probation or dismiss any student who according to its judgment is not making satisfactory academic progress. In making such judgment, the Committee is guided by the following standards and notifies the students of its decision.

Class Attendance

Students are expected to attend all classes and laboratory sessions in the courses for which they are registered. Students who miss classes are far less likely to succeed in meeting the requirements of the course. Each teacher outlines his or her expectations for class attendance in the course syllabus. Teachers are expected to keep accurate records of student attendance. If a student does not attend a minimum of 67% (or a higher percentage set by the instructor on the course syllabus) of the class and laboratory sessions, he/she will not be permitted to take the final examination in the course.

Academic Dismissal and Readmission

Students who are Academically Dismissed will not be permitted to enroll at Forman Christian College for at least one (1) full semester (Spring or Fall). If a record is consistently poor, a student may not be permitted to return.

Any student who has been Academically Dismissed from FCC and wishes to be readmitted as a full-time student must submit a completed Application for Readmission to the Office of the Vice Rector and meet all conditions for readmission. If the student has taken coursework at another institution while on dismissal, an official transcript of that work should be forwarded to the Vice Rector as part of the Application for Readmission.

Academic Probation

Students are expected to maintain good academic standing. Official notification concerning academic standing will be given to all full-time students whose performance does not meet the prescribed standards of the university. After each semester, the Academic Standard Committee and the Vice Rector will determine whether students experiencing academic difficulty will be placed on Academic Probation, suspended on Probation or dismissed from the university. Academic Dismissal carries specific conditions established by the Academic Standard Committee (see below).

The designation "Academic Probation" will appear on the student's transcript. It is used to alert students that the quality of their work is below that required for graduation. It is also a way of informing the student that, unless improvement is seen in the following semester, they may be dismissed.

The criteria for determining Academic Probation are:

Semester Hours Completed	Minimum Cumulative GPA (CGPA) Required for Good Standing
0-35	1.50
36-64	1.75
65 or more	2.00

Students with academic troubles who have been placed on probation must:

1. Attend all class meetings of every course in which they are enrolled.
2. Schedule meetings with their academic Advisors at least once every two weeks.
3. Adhere to any other provisions established by the Academic Standard Committee.

Any student who fails to observe the conditions of Academic Probation is subject to review at any time by the Academic Standard Committee and/or the Vice Rector and may be dismissed from the university.

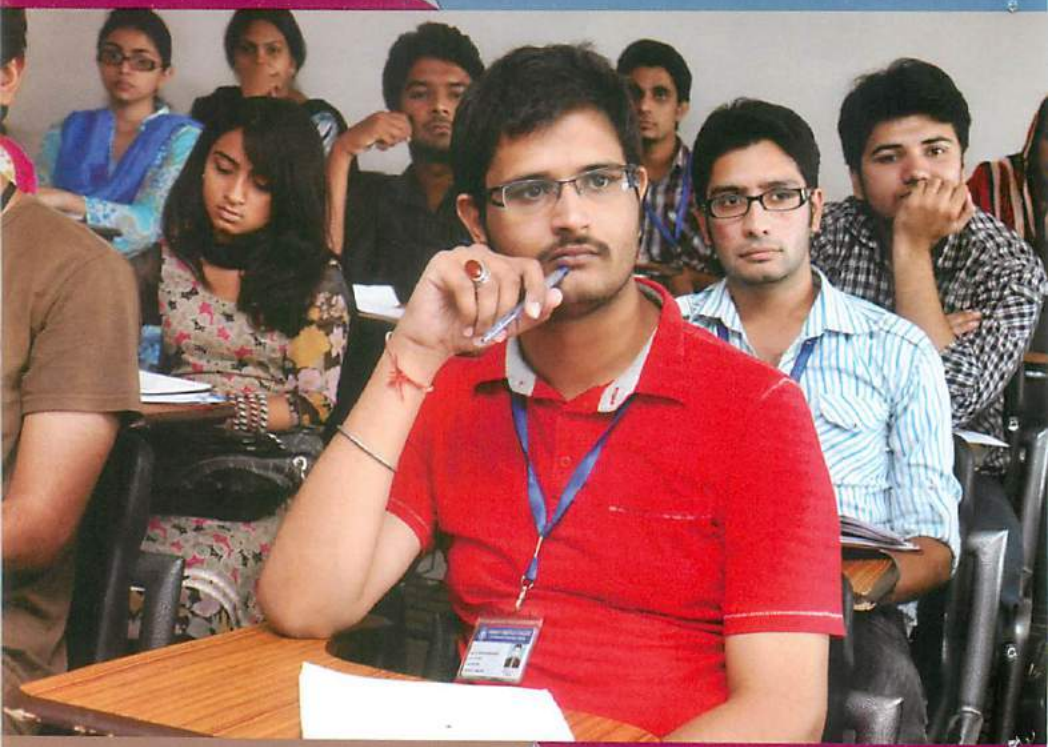
Removal from Academic Probation

Probationary status remains in effect until the student completes four courses at FCC in one semester with C or better grades and the overall number of B or better grades at least equals the number of D grades.

Suspension from Co-Curricular and Sports Activities

A student placed on academic probation or subject to dismissal for a second consecutive semester is suspended from participation in co-curricular or sports activities so that the student may devote full time to the studies.

7. Academic Support for Students



English Language Courses

For all students entering the baccalaureate program with deficient English skills, a special immersion program has been developed. These LANG courses equip students with enough skills in the English language to manage the rigors of academic work at FCC.

All entering students will take the ACCUPLACER for course placement. Students who do well will be placed into ENGL 101 or ENGL 103. Students with low scores will be placed into LANG and will need to clear the LANG final exam (ACCUPLACER and Spoken Test) as a prerequisite for ENGL 101. Promotion is determined by performance on the final exam (ACCUPLACER and Spoken Test) and is not based on the course grade.

Number of credits per semester:

- LANG 100 students can only take 12 credits of LANG and 3 credits of Urdu.
- LANG 110 students can only take 12 credits of LANG and 3-4 credits in one other course.
- Students can repeat LANG courses, but can only receive credit once for LANG 100 and once for LANG 110. The maximum time allowed to clear LANG is three consecutive semesters.

University 100

Prerequisite LANG 110 (or exempted from the Language Program)
All entering students must take University 100 during their first semester or after they have finished the Language program. Transfers with 60 or more credits are exempted.

Advising

Each student will be assigned to a faculty member who will serve as his/her Advisor. The Advisor will work with the student to select courses and class schedule, and they will discuss career planning and personal growth. Once the student selects a major program of study, the advising will be done by a faculty member from that department. It is each student's responsibility to meet with his or her Advisor at least once each semester to review their academic progress. Students will have as much guidance as they need and as much freedom as they can responsibly handle.

8. Awards

Vice Rector's List

The Vice Rector's List is published following the fall semester and the spring semester and includes names of students who completed at least four courses with a grade point average of 3.75 or better. Students with incomplete grades at the time of publication are not eligible.

Honors at Graduation

FCC awards diploma with Honors to a few students in each graduating class. The criteria and designation for graduation with Honors are:

Summa Cum Laude (Highest Honors)	3.90 or above CGPA
Magna Cum Laude (High Honors)	3.70 to 3.89 CGPA
Cum Laude (Honors)	3.50 to 3.69 CGPA

Migrated (transferred) students are not eligible to graduate with Honors unless they have completed more than half of their graduation requirements at FCC.

Scholar Athlete Trophy

This trophy is awarded to the students who fulfill the following criteria:

- Senior standing (transfer students MUST have completed at least half the required credits to graduate)
- CGPA at end of Junior year above 3.00
- No academic probations
- Involved in team sports/track and field/swimming
- Participated in a minimum of nine intervarsity competitions over the three years
- Won first or second place in a minimum of three intervarsity competitions
- Participated in intramurals
- Won intramurals
- Cleared the fitness test
- Participated and won a position in at least two events at the Annual Sports Gala for two years
- Consistently displays sportsmanship
- Clear of any disciplinary actions

Medals

Prof M S Bhatti
Dedicated to a renowned former teacher; it is awarded to the student securing the highest CGPA amongst the university candidates in the **Faculty of Humanities.**

Sir Mian M Shafi
Dedicated to a renowned former teacher; it is awarded to the student securing the highest CGPA amongst the university candidates in the **Faculty of Social Sciences.**

Sir Shaikh Abdul Qadir
Dedicated to a renowned former teacher; it is awarded to the student securing the highest CGPA amongst the university candidates in the **Faculty of Education.**

Swami Ram Kiran
Dedicated to a renowned former teacher and saint; it is awarded to the student securing the highest CGPA amongst the university candidates in the **Faculty of Mathematics and Computer Science.**

Dr J H Orbison
Dedicated to a renowned former teacher and founder of the Biological Science Department; it is awarded to the student securing the highest CGPA amongst the university candidates in the **Faculty of Natural and Physical Sciences.**

Dr E D Lucas
Dedicated to a renowned former Principal and Economist; it is awarded to the student securing the highest CGPA amongst the university candidates in the **Department of Economics.**

Dr C M Hussain
Dedicated to the father of Dr Wasiq Hussain (Dean of the Faculty of Information Technology & Mathematics). Dr C M Hussain was a renowned mathematician. This medal is awarded to the student securing the highest CGPA (at least 3.0) amongst the university candidates in the **Department of Mathematics.**

Prof E J Sinclair
Dedicated to a renowned former Principal; it is awarded to the student securing the highest CGPA amongst the graduating class for the degree of **Bachelor of Arts (Honors).**

Khan Bahadur Muhammad Sanaullah
Dedicated to a renowned alumnus; it is awarded to the student securing the highest CGPA amongst the graduating class for the degree of **Bachelor of Science (Honors).**

Professors' Medals

Sponsored by the faculty of the School of Management; these medals are awarded to the students securing the top three CGPAs amongst the university candidates in **Bachelor of Science (Honors) Business.**

Unilever Medal

Unilever is a globally recognized brand for fast moving consumer goods; this medal is awarded to the student securing the highest CGPA amongst the university candidates in **Bachelor of Science (Honors) Business specialization in Marketing and Sales.**

Shezan Medal

Shezan is one of Pakistan's oldest brands in the food industry; this medal is awarded to the student securing the highest CGPA amongst the university candidates in **Bachelor of Science (Honors) Business specialization in Operations Management.**

Askari Investment Medal

Askari Investment Management is the asset management company of Askari Bank and is at the forefront of providing investment products for individuals and institutions; this medal is awarded to the student securing the highest CGPA amongst the university candidates in **Bachelor of Science (Honors) Business specialization in Accounting and Finance.**

9. Liberal Arts

A Liberal Arts Education

Forman Christian College is currently the only university in Pakistan offering a true liberal arts baccalaureate education, which provides the students with a good balance of depth and breadth of learning. This is done by ensuring that in addition to their selected major, all Baccalaureate students take a minimum number of courses in Humanities, Physical and Natural Sciences, Mathematics and Information Technology, and Social Sciences.

Depth of learning gives students the opportunity for career preparation; it teaches them to think critically, communicate effectively, solve problems and become lifelong learners, while breadth of learning provides the basis for students to understand modern issues as they develop, and to live a life of quality. It develops in them a healthy curiosity about the world and above all to be good citizens of their countries and the world.

The 4-year Baccalaureate program is designed to prepare graduates to succeed in a wide variety of occupations and to advance to positions with higher responsibilities. The program provides a world class education at Pakistani prices. Our graduates are able to enter postgraduate programs abroad without taking further courses.

Majors/Areas of Concentration/Minors

A liberal arts education gives students the opportunity to choose from a wide variety of majors, minors and specializations in a major in consultation with their academic Advisor. Students can also choose to do double majors, minors and more than one specialization after discussion with the relevant department and their Advisor.

General Education

An important part of the program for each student is General Education. Students must take a total of 47 credit hours in the General Education program. This includes three courses in each of the following areas of human knowledge: Natural and Physical Sciences, Humanities, Social Sciences and Computer Science/Mathematics. Four courses are required in Communications.

10. Careers and Internships

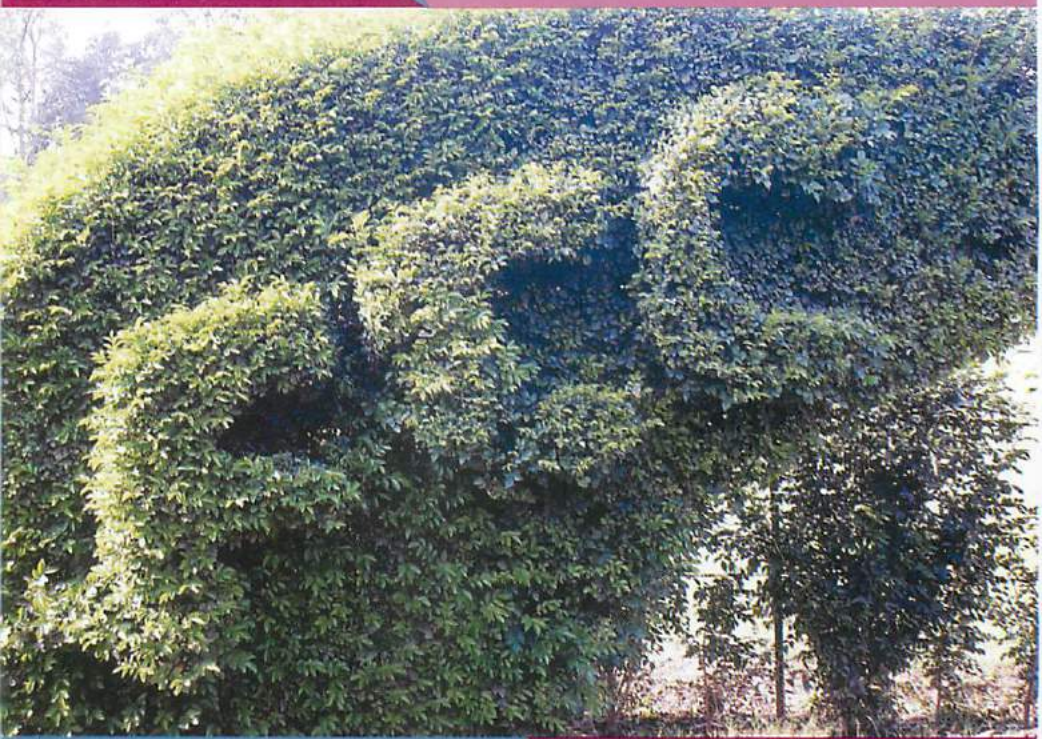
Career Services and Placement

The Career Services Office provides resources to students which help them to make responsible decisions. The Office also helps provide awareness about career options and job search by inviting prospective employers for seminars and holding job fairs on campus. The Formanite Alumni Association is developing a network of advisors who will assist students in discovering the requirements and benefits of different career choices.

Internships

The Career Services Office provides resources to students which help them to make responsible decisions. The Office also helps provide awareness about career options and job search by inviting prospective employers for seminars and holding job fairs on campus. The Formanite Alumni Association is developing a network of advisors who will assist students in discovering the requirements and benefits of different career choices.

11. Academic Departments



Forman Christian College offers various disciplines in its arts and science degree programs. The following departments offer majors in the BA/BSc programs.

Department	Degree(s) • Specializations	Under Faculty
Biological Sciences	BSc (Hons) Biological Sciences BSc (Hons) Biotechnology	Natural Sciences
Business	BSc (Hons) Business • Accounting & Finance • Operations Management • Marketing & Sales	Faculty of Business & Economics
Chemistry	BSc (Hons) Chemistry • Organic Chemistry • Physical Chemistry • Inorganic Chemistry	Natural Sciences
Computer Science	BSc (Hons) Computing • Computer Science • Information Technology • Software Engineering	Information Technology and Mathematics
Economics	BSc (Hons) Economics	Faculty of Business & Economics
Education	BA/BSc (Hons) Education	Education
English	BA (Hons) English	Humanities
*	BSc (Hons) Environmental Sciences	Natural Sciences
Geography	BA/BSc (Hons) Geography	Social Sciences
History	BA (Hons) History	Social Sciences
Mass Communication	BA (Hons) Mass Communication	Humanities
Mathematics	BSc (Hons) Mathematics	Information Technology and Mathematics
Philosophy	BA (Hons) Philosophy	Humanities
Physics	BSc (Hons) Physics	Natural Sciences
Political Science	BSc (Hons) Political Science	Social Sciences
Psychology	BA/BSc (Hons) Psychology	Organizational & Behavioral Studies

Department	Degree(s)	Under Faculty
Religious Studies	BA (Hons) Christian Studies BA (Hons) Islamic Studies	Humanities
Sociology	BSc (Hons) Sociology	Organizational & Behavioral Studies
Statistics	BSc (Hons) Statistics	Information Technology and Mathematics
Urdu	BA (Hons) Urdu	Humanities

* BSc (Hons) Environmental Sciences is a cross-disciplinary degree, which comes under three departments: Biological Sciences, Chemistry and Physics.

12. Department of Biological Sciences

Introduction

The Biological Sciences Department at Forman Christian College was founded in 1870. A long line of distinguished professors - including Dr Saithi, Dr Purio, Dr H K Bhatti and Dr K K Bell - have made significant contributions to the field.

The last few years have been busy and productive for the department. At the undergraduate level, it has established 4-year degrees in Biology and Biotechnology and a cross-disciplinary degree in Environmental Sciences.

The well-qualified and experienced faculty are involved in various research programs involving both graduate and undergraduate students. The department has nine dedicated research and six teaching laboratories as well as state-of-the-art equipment.

The department is part of the Faculty of Natural Sciences.

The following programs are offered by the Department of Biological Sciences:

- BSc in Biological Sciences
- BSc in Biotechnology

BSc (Hons) Biological Sciences

BSc (Hons) Biological Sciences is one of the broadest and most comprehensive undergraduate programs in Pakistan. It is designed to offer a broad and general training in plant and animal sciences with opportunity for research to meet the needs of students preparing for postgraduate work or the job market.

Learning Objectives

1. Explain the key concepts and principles of biological sciences.
2. Plan and execute laboratory methods and procedures and be able to interpret scientific data.
3. Demonstrate ability of creative thinking to ethically solve real life problems.
4. Apply concepts and information related to biological sciences to the real world.
5. Demonstrate consistent behavior to learn and work cooperatively in groups.
6. Integrate knowledge and skills necessary for the intelligent performance of major tasks required at the entry level of field.
7. Evaluate biological literature and use it to explore opportunities in the field of biology such as entrepreneurship, research and development, teaching and consultation.

Requirements for the Major

A total of 48 credit hours in Biological Sciences: 24 credit hours of BIOL 201, 202, 203, 204, 301, 302, 303, and the remaining 24 credit hours from BIOL 205, 211, 313, 315, 473, *497 (Internship 6 credits), or *499 (Research 6 credits), and BIOT 313, BTNY 207, 403, 463, ZOOL 303, 304, 305, and 408.

* Students with CGPA 2.75 or above will be eligible for research/Internship. Students are required to appear in a test and interview. Research or Internship will be allotted to the students on the recommendation of the Departmental Committee.

Students majoring in Biological Sciences must take 8 credit hours of Chemistry courses (300/400 level) in consultation with the faculty Advisor.

Requirements for the Minor

A minor in Biological Sciences is open to students in the following disciplines: Chemistry and Physics with a minimum CGPA of 2.5.

Core Courses required for all minors:
BIOL 202, BIOL 204, BIOL 301 and BIOL 302.
3 courses from others listed in the catalog at the 300 or 400 level.

BSc (Hons) Biotechnology

The BSc (Hons) Biotechnology program is learner-centered and job oriented. It establishes an environment of collaborative and reflective learning based on modern concepts of Biotechnology.

Learning Objectives

1. Master the key concepts and principles of life sciences.
2. Explain the basic techniques used in biotechnology.
3. Be able to analyze and interpret the experimental data.
4. Demonstrate the use of various biotechnological processes for economic development.
5. Be able to assess various biotechnologies from an ethical point of view

Requirements for the Major

A total of 64 credit hours in Biotechnology: 34 credit hours of BIOL 201, 203, 313, 315, BIOT 201, 202, 301, 302, 313 and 314 and the remaining 30 credit hours from BIOL 205, 211, BIOT 305, 307, 309, 315, 316, 407, 408, 411, 412, *BIOT 498 (Internship 6 credits) or *BIOT 499 (Research 6 credits).

Pre-Engineering and Arts students will have to take all of the following courses as prerequisites: BIOL 100, 102, 105.

Those who have not studied Chemistry at higher secondary school or A Level or equivalent must take CHEM 100.

Those who have not studied Physics at higher secondary school or A Level or equivalent must take PHYS 100.

*Students with a CGPA 2.75 or above will be eligible for research/internship. Students are required to appear in a test and interview. Research or internship will be allotted to the students on recommendation of the Departmental Committee.

Requirements for the Minor

Four core and seven elective courses (300 & 400 levels) selected in consultation with the faculty Advisor. An intention to minor in Biotechnology must be declared prior to the Junior year.

Course Descriptions

BIOL 100: Introductory Biology (4 credits)
Only for students who have not studied Biology in higher secondary school or A level or equivalent
Basic concepts of Biology including cell as a building block, its function, reproduction, genetics and inheritance, basic concepts in evolution, ecology and principles of living systems, an overview of modern Biology and its importance in everyday life.

BIOL 102: Introductory Plant Biology (4 credits)
Only for students who have studied Biology in higher secondary school/A Level or equivalent
Structure-function relationship of plants, basic principles of genetics and molecular genetics and Biotechnology and its use in modifying plants. Ecosystems, environmental issues, relevance of flowering plants in human life.

BIOL 105: General Zoology (4 credits)
Only for students who have studied Biology in higher secondary school/A Level or equivalent
The structure, functions, ecology and evolution of all major animal groups including invertebrates and chordates, origin of multicellular forms and basic environmental factors affecting them.

BIOL 201: Cell Biology (3 credits)
Ultra structure of cell, the cell membrane, cytoskeleton, nucleus, mitochondria,

chloroplast, ribosome, dictyosome, vacuole, microbodies and cell surface. Protein synthesis and secretion, chromosomal aberrations, mitosis, meiosis and cell cycle regulation will also be discussed.

BIOL 202: Diversity in Plants (4 credits)
Classification of organisms, survey of algae, fungi and various groups of plants with emphasis on evolutionary trends.

BIOL 203: General Genetics (3 credits)
Concept of gene, Mendelian inheritance, sex-linked inheritance, linkage and crossing over, cytoplasmic inheritance, structure, chemistry, functions and types of DNA and RNA, recombination in viruses, bacteria, fungi and eukaryotes, Operon model, transposable elements, genetic code, variation in chromosomal number and structure, population genetics and problems related to the theoretical course.

BIOL 204: Diversity in Animals (4 credits)
Classification and phylogenetic relationship of various groups of animals, with an overview of all major groups of invertebrates and chordates (general survey of animal kingdom).

BIOL 205: Biostatistics (3 credits)
Introduction to statistics including mean, mode, median, standard error and standard deviation, probability and test of significance, correlation, analysis of variance, regression and experimental design.

BIOL 211: Biosafety and Biosecurity (3 credits)
Prerequisite: BIOL 102 or BIOL 105 or Biology in Intermediate
Overview of biosecurity/biosafety and the practices, equipment and facilities for the safe and secure handling of dangerous pathogens in a laboratory setting.

BIOT 201: Introduction to Biotechnology (3 credits)
Brief history of Biotechnology, different aspects of Biotechnology and its future development as a cornerstone in human welfare.

BIOT 202: Protoplast, Cell and Tissue Culture (4 credits)
Brief history of tissue culture technique, plant growth regulators, culture media, microbial contamination and prevention procedures. Plant cell, tissue and organ culture, animal cell culture. Multiplication and differentiation of cells. Callus, suspension and cell line culture. Isolation, culture and fusion of protoplasts and application of tissue culture techniques.

BTNY 207: Economic Botany (3 credits)
Improvement of plants for better yield of their economic products, strategies for the domestication and preservation of economic plants. Plants as a source of food, beverage, herbs and spices. Medicinal plants, psychoactive plants, poisonous and

allergy causing plants. Fibers, dyes, tannins, hydrogel, latexes and resins, wood cork and bamboo.

BIOL 301: Plant Form and Function (3 credits)
Analysis of plant structure and function, overview of plant organization from cell to organismic level, and appreciation of physiological processes as they relate to the plant survival and adaptability.

BIOL 302: Animal Form and Function (4 credits)
Comparison of animals with one another, similarities and differences among the major phyla of animal kingdom, external and internal variations in organs and systems and adaptations that enable them to live successfully in their respective environments.

BIOL 303: General Ecology (3 credits)
Basic principles of Ecology such as interaction of organisms with their environment, species and population dynamics, community structure and human interactions with natural populations and ecosystems. Emphasis on local environment, flora and fauna.

BIOL 313: Biochemistry (4 credits)
Prerequisite for non-science students: CHEM 110
Understanding of organic structure of living systems including structure, specific roles of carbohydrates, lipids, amino acids, proteins and nucleic acids. General characteristics and properties of enzymes including enzyme kinetics.

BIOL 315: Fundamentals of Microbiology (3 credits)
This course deals with the study of microbial life and its function using pure culture techniques, microscopy, bacterial morphology and anti-microbial resistance with their applications in industry, Biotechnology, Environmental science and basic research.

BIOT 301: Analytical Techniques in Biology (3 credits)
Fundamental techniques in Biological Sciences involving vast array of methodologies that a biologist requires to step in any area of research. Various types of Chromatographies, Gel electrophoresis, Staining procedures, Spectrophotometery and Microtomy.

BIOT 302: Fundamentals of Enzymology (4 credits)
Brief history of enzymes, the nature of the enzyme structure, an introduction to the amino acids that make up protein structure and determine function relationships, specificity of enzyme action, physical organization of enzymes (multienzyme complex), chemical and enzymatic kinetics, enzyme-substrate interaction and the roles that enzymes play as the fountain of life.

BIOT 305: Commercialization of Biotechnology Products (3 credits)
An overview of commercial products and services that Biotechnology offers, general aspects related to quality control and criterion for industrially important bioprocesses, their management and impact on present day market. Resource planning and management of bio-inoculants; antimicrobial agents; metabolites, enzymes and therapeutic proteins. Biotechnology and intellectual property right, industry interaction and technology transfer, basics of effective marketing and promotion of Biotechnology products and steps involved in commercialization of biotechnological merchandise.

BIOT 307: Molecular Immunology (3 credits)
Introduction to immunology; the basic processes involved in triggering the immune system and rendering it resistant or susceptible to different infections, study of molecular and biochemical events that influence immune responses, innate (Non-specific) and adaptive (Specific) immunity, immunoglobulins: structure and functions, antigens, antibody formation and hypersensitivity.

BIOT 309: Microbial Biochemistry (3 credits)
Microbial growth: mathematical expression of growth, growth curve, measurement of growth and growth yields; synchronous growth and continuous culture, metabolic diversity among microorganisms, metabolism of carbohydrates, lipids, amino acid, purines and pyrimidines in prokaryotes, antimicrobial agents: mode of action and resistance to antibiotics.

BIOT 313: Molecular Biology (4 credits)
Prerequisite: BIOL 201
History, structure and function of DNA, DNA replication in prokaryotes and eukaryotes, structure, function and types of RNA, transcription, post transcriptional processing, translation, post translation processing in prokaryotes and eukaryotes, control of gene regulation in prokaryotes and eukaryotes, mutation and mutagens, DNA damage and repair, recombination and transposable elements.

BIOT 314: Bioenergetics and Metabolism (3 credits)
Prerequisite: BIOL 313
Intermediate metabolism in biological systems, pathways of breakdown and synthesis of biological molecules such as carbohydrates, lipids and nitrogenous compounds, thermodynamics of the reactions and the regulatory mechanism of pathways.

BIOT 315: Genomics and Tools of Bioinformatics (4 credits)
Prerequisite: BIOT 313
Introduction to Genomics, techniques involved in studying of genomes i.e. manual and automated DNA sequencing, genotyping, mapping and assembling a genome, an introduction to pharmacogenomics, personal genomics, SNP, RFPL, microstelite DNA Markers, brief history and introduction of bioinformatics, use of online data

banks for nucleic acid and protein analysis, prediction of attributes of proteins and nucleic acids on the basis of tabulated data, DNA microarray, proteomics and survey of a genome of a model organism using bioinformatics tools.

BIOT 316: Fundamentals of Virology (4 credits)
Origin and nature of viruses, taxonomy and classification, ultra structure of viruses, virus isolation, purification and identification, models of viral replication, viral genome analysis, chemotherapy of viral infections, virus host interaction, immunity to viral infections, important viral families of human importance, family characteristics, transmission, epidemiology and pathogenicity.

ZOOL 303: Animal Physiology and Endocrinology (4 credits)
Prerequisite: BIOL 302
Intracellular organization and their integration, feeding, digestion and metabolism, internal transport and gas exchanges, mechanism of contractile system and movement, osmoregulation and disposal of metabolic wastes, neural signaling and regulation, mechanism of sensory receptors, hormone regulation and reproduction, development, growth and social behavior.

ZOOL 304: Developmental Biology and Animal Behavior (4 credits)
Prerequisite: BIOL 302
Early stages of development involving the cellular basis of morphogenesis in representative animals, fundamentals of behavior, innate and learning orientation, feeding and social behavior, animal communication, physiological basis and evolution.

ZOOL 305: Integrated Pest Management (4 credits)
Prerequisite: BIOL 302
People, plants and pests, dynamics of pest populations, intensive agriculture, pest problems, cultural control, host plant resistance, parasitoids and predators, microbial control, botanical pest control, synthetic organic insecticides biotechnology approaches, bio-rational and other innovative approaches, IPM achievements, potential and challenges.

BIOL 473: Industrial Microbiology (4 credits)
Prerequisite: BIOL 315
Attributes of microorganisms and the applications of modern techniques in the applied areas of industrial and environmental microbiology, applications of microorganisms in the industrial production of foods and other useful products.

BIOL 497: Internship (6 credits)
Students with CGPA of 2.75 or above will be eligible for internship. Students are required to sit for a test and appear in an interview. Internship will be allotted to the students on recommendation of the Departmental Committee. Duration of internship is from 6 to 8 weeks and it is usually offered in summer to Juniors.

BIOL 499: Research (6 credits)

Students with CGPA 2.75 or above will be eligible for research

Students are required to sit for a test and appear in an interview. Research will be allotted to the students on recommendation of the Departmental Committee. It is usually offered in summer to Juniors.

BIOT 407: Aquaculture Technology (4 credits)

Introduction, sources and quality of water, culture systems (open, semi-closed and closed system), water flow and pumps, filtration and water treatment, culture methods for seaweed, molluscans, crustacean fish and higher vertebrates, natural food and artificial feed harvesting techniques, policies on leasing.

BIOT 408: Recombinant DNA Technology (4 credits)

Basic genetic engineering experiments, fundamental techniques and essential enzymes used in DNA technology, cloning vectors, plasmids, phages, phagemids, M-13 vector, yeast artificial chromosomes, bacterial artificial chromosomes, P1 artificial chromosomes, expression vectors and cosmids, cloning strategies with discussion of situations where these strategies would apply. Construction of DNA libraries.DNA restriction mapping. Studying the transcript of a cloned gene, efficient expression of cloned gene, application of recombinant DNA technology; transgenic animals and plants gene therapy.

BIOT 411: Agriculture Biotechnology (4 credits)

Prerequisite: BIOT 201

Introduction and origins of Biotechnology, Soil Biotechnology, microbial interactions in agriculture, microbial control of fungal plant pathogens and importance of micro-organisms for soil fertility, plant growth promoting rhizobacteria, secondary metabolites with antifungal activities, methods to produce transgenic plants biotic and abiotic resistance, genetic manipulation of fruit ripening, engineering plant protein composition for improved nutrition, genetic manipulation of crop yield by enhancement of photosynthesis, production of high value proteins in plants, vaccines from plants and biofuels.

BIOT 412: Medical Biotechnology (4 credits)

Prerequisite: BIOT 313

Nanobiotechnology, cancer immunotherapy, gene therapy, stem cell biotechnology, knockout mice and gene inserts, siRNA, genetically engineered animals, infectious diseases, diagnostics and antibiotic resistance, biomaterials in regenerative medicine, vaccine technology, novel antimicrobial agents, their design and other future medical biotechnologies.

BIOT 498: Internship (6 credits)

Students with CGPA 2.75 or above will be eligible for internship. Internship will be allotted to the students on recommendation of the Departmental Committee. Duration of internship is from 6 to 8 weeks and usually offered in summer to juniors.

BIOT 499: Research (6 credits)

Student with CGPA 2.75 or above will be eligible for research

Research will be allotted to the students on recommendation of the Departmental Committee. Research is usually offered in summer to juniors.

BTNY 403: Plant Physiology (3 credits)

Prerequisite for non-science students: BIOL 301

Application of physical and biological principles, understanding of plant processes involved in assimilation, metabolism and regulation of growth and development.

BTNY 463: Palaeopalynology (4 credits)

Prerequisite for non-Biology students: BIOL 202

Introduction, scope and importance with emphasis on geological time scale. Rock types, polymorphs in oil and gas explorations, geochronology, vegetational analysis from pollen data, stratogeographic leak, post depositional alteration of palynomorphs, coal formation and classification of Gonwandaland palynofloristics.

ZOOL 408: Entomolgy (4 credits)

Prerequisite BIOL 302

Origin of insects, morphology, anatomy, natural habitat, social behavior, appendages, life histories and economic importance. Biological control of pests.

13. Department of Business

Introduction

The Department of Business at Forman Christian College was established in 2005 and has already gained a reputation for the quality and diversity of its programs. It aims to add great value to participants. The programs have been designed by a team that has a rich experience of developing and leading high quality management programs in the country at undergraduate, graduate, and at Executive levels. The Department of Business is part of the Faculty of Business and Economics in the School of Management.

BSc (Hons) Business

The 4-year degree has a strong emphasis on developing skill and confidence and offers specializations in Accounting & Finance, Operations Management and Marketing & Sales Management. The program has been designed to ensure that students understand best practice in business and function efficiently in the practical world. The course contents intend to provide the right balance between academics and real world application.

Students take core (required) courses throughout the four years of the program and begin to take courses in their areas of specialization from the third year. Business students are expected to maintain a minimum CGPA of 2.0 during the program. However, business students are expected to maintain a higher CGPA in their major. Students take 64 credit hours in their business major as well as 47 credit hours in General Education and 15 free electives. The choice of specialization is made in the second year. Additionally, all business students must also undertake an internship, worth 6 credit hours.

Learning Objectives

1. Describe key concepts and theory of best practice in management, finance, and marketing.
2. Demonstrate technical rigor for analysis and decision making in business.
3. Apply leadership skills for effective future business management.
4. Analyze the demands of the local environment and apply business skills and tools to the real world.
5. Employ interpersonal and communications skills required by effective managers.
6. Consistently use values and ethics in a business environment.
7. Describe entrepreneurial career opportunities that serve the needs of Pakistan and the international community.

Course Descriptions

General Courses

BUSN 101: Principles of Accounting (3 credits)
Understanding accounting records, entering transactions, applying accounting concepts, principles and practices and reading financial statements.

BUSN 121: Microeconomics (3 credits)
Fundamentals of economics including price theory and applications, industry and market structure, equilibrium analysis and welfare economics.

BUSN 160: Management Communications (3 credits)
Introduction to verbal and written communication theory and practice, with focus on individual oral and written skills in letter and memo writing, use of emails, presentations and preparing reports.

BUSN 170: Principles of Management (3 credits)
Basic management concept tools, techniques for improving organizational efficiency and effectiveness, management process consisting of planning, organizing, staffing, directing, coordinating, reporting and budgeting (POSDCORB).

BUSN 201: Intermediate Accounting 1 (3 credits)
Prerequisite: BUSN 101
Concepts, standards and principles underlying various accounting practices and techniques, reporting requirements, group accounts and corporate financing.

BUSN 206: Management Accounting and Control (3 credits)
Prerequisite: BUSN 101
Using accounting information, especially costs, to make management decisions, cost accounting information and the role of budgeting to facilitate rational decision-making, introduction of structures and systems for control.

BUSN 225: Economic Applications for Business (3 credits)
Prerequisite: BUSN 121
Fiscal, monetary and regulatory policy frameworks including deregulation and liberalization from a perspective of application of theory to real world practices.

BUSN 230: Entrepreneurship (3 credits)
Prerequisite: BUSN 170
Entrepreneurial skills for successful formation and growth of companies including topics like team formation, concept generation, design thinking, marketing mix, etc.

BUSN 250: Individual & Group Dynamics (3 credits)
Prerequisite: BUSN 170
Impact of individuals, groups and structures on behavior within a formal organizational context and applies knowledge to improve the effectiveness of the organization. Concepts include leadership skills, team structures, managing interpersonal relationships and conflicts.

BUSN 280: Marketing & Selling Skills (3 credits)
Prerequisite: BUSN 170
Basic tools and skills to develop an effective marketing orientation for developing and marketing products and services, identifying problems and solutions, as well as application of concepts, development of selling skills.

BUSN 321: Financial Management I (3 credits)
Prerequisite: BUSN 201
Tools, techniques and concepts of finance, such as financial analysis, financing options, capital budgeting, risk analysis and the role of financial markets and intermediaries.

BUSN 360: Operations & Project Management I (3 credits)
Prerequisite: BUSN 170
Evaluation and implementation of projects within organizations, management of operational structures and systems to achieve organizational goals and objectives.

BUSN 370: Management Information Systems (3 credits)
For Junior and Senior year students only
Prerequisite: BUSN 170
Business and accounting applications of MIS, techniques for evaluating and implementing various management information systems in an organization.

BUSN 390: Summer Internship (6 credits)
All business students must undertake the internship in the summer after the Junior year.

BUSN 460: Business Law (3 credits)
For Senior year Business students only
Laws pertaining to the functioning of business with strong emphasis on theory and practice in Pakistan, tax law and labor law.

BUSN 490: Analysis of Institutions (3 credits)
For Senior year Business students only
Analysis of institutions in the public, private and not-for-profit sectors which have shaped the economic and corporate environment of Pakistan, economic history, public policy and interaction of different institutions that has shaped Pakistan as a country.

BUSN 498: Business Strategy (3 credits)
For Senior year Business students only.
This is the capstone course in the program: theories and concepts of strategy, real world problems and application of theory to practice through projects.

Accounting and Finance Specialization

BUSN 301: Financial Reporting (3 credits)
Prerequisite: BUSN 201
Generation of accounting information needed by different stakeholders, leasing, stakeholder's equity, earnings per share and financial instruments such as government issues.

BUSN 305: Corporate Governance (3 credits)
Prerequisite: BUSN 201
Governance in corporations, spanning issues related to regulation, fiduciary responsibilities, agency problems and the structures and systems used to improve governance in organizations.

BUSN 322: Financial Management II (3 credits)
Prerequisite: BUSN 321
Corporate finance, dividend policy, capital structure, international financial instruments, debt and equity valuation and the role of hybrid securities.

BUSN 401: Principles of Auditing (3 credits)
Prerequisite: BUSN 301
Fundamentals of auditing, issues of ethics, role of audit firms in conducting audits.

BUSN 404: Taxation (3 credits)
Prerequisite: BUSN 301
Analysis of laws pertaining to taxation, tax structure, corporate taxation and related issues.

BUSN 410: Accounting Information Systems (3 credits)
Prerequisite: BUSN 301
Complementarity and application of information technology to accounting, development of systems and software for the profession.

Operations Management Specialization

BUSN 361: Operational Excellence (3 credits)
Prerequisite: BUSN 360
Application of concepts and skills in a production-related environment resulting in better work flow.

BUSN 364: Production, Scheduling & Loading Operations (3 credits)
Must be taken at the same time as BUSN 360 for students specializing in Operations Management.
Critical operational processes: manufacturing, scheduling and factory loading, and their role in meeting production targets, supervision and monitoring.

BUSN 368: Productivity & Plant Management (3 credits)
Prerequisite: BUSN 360
Improvement in efficiency of manufacturing processes, optimal utilization of plant and equipment with the objective of improving profitability.

BUSN 461: New Product Development (3 credits)
Prerequisite: BUSN 361
New productions, satisfying customer needs, importance of technological and management challenges.

BUSN 464: Total Quality Management (3 credits)
Prerequisite: BUSN 361
Philosophy of TQM, its key principles and concepts focusing on continuous improvements for customer satisfaction.

BUSN 469: Project Management Processes (3 credits)
Prerequisite: BUSN 361
Tools required to coordinate different activities which result in timely completion of projects.

Marketing and Sales Specialization

BUSN 380: Advanced Marketing & Sales (3 credits)
Prerequisite: BUSN 280
Advanced tools, concepts and techniques of marketing, international marketing and marketing strategy.

BUSN 382: Marketing Communications (3 credits)
Prerequisite: BUSN 280
Marketing channels, such as advertising and promotion management, and means to promote and project products and brands.

BUSN 385: Consumer Behavior (3 credits)
Prerequisite: BUSN 280
Current trends in real world marketing, its challenges and analysis, development of effective marketing programs and strategies.

BUSN 480: Marketing Research (3 credits)
Prerequisite: BUSN 380
Qualitative and quantitative research methods used in marketing, application of technical and conceptual tools to real world situations through projects and studies.

BUSN 484: Brand Management (3 credits)
Prerequisite: BUSN 380
Creating and sustaining brands, tools and concepts of marketing and their application to analyze the evolution of brands.

BUSN 485: E-Business (3 credits)
Prerequisite: BUSN 380
Application of technology in the business world, electronic media and new channels for developing businesses, promotion of products and services.

14. Department of Chemistry

Introduction

The Department of Chemistry is one of the oldest departments at Forman Christian College. It enjoys a rich heritage of eminent chemistry scholars, three especially being worthy of mention. Prof Carter Speers (1940-1951) was head of the department and professor of Technical Chemistry, University of the Punjab. Dr R F Tebbe, a devoted organic chemist and a learned teacher, spent 12 years at FCC as professor of chemistry and was its principal. Prof Dr Khairat M. Ibne Rasa, a scientist of international repute, was a professor of organic chemistry and also served as Head of the Chemistry Department. He later became Vice Chancellor of Punjab University (1976-1984) and of Bahauddin Zakariya University Multan (1975-1976) and served as deputy director general of the Islamic Educational, Scientific and Cultural Organization (IESCO).

The Department of Chemistry at FCC offers a BSc (Hons) degree in Chemistry that concentrates on building its students' professional capacity as chemists through a variety of courses and learning activities. The department belongs to the Faculty of Natural Sciences.

BSc (Hons) Chemistry

The program facilitates the students to demonstrate their ability to analyze real world situations using academic knowledge and provides opportunity to excel both in the job market and future study.

Learning Objectives

1. Describe major chemistry concepts.
2. Think critically and use chemistry concept and theories.
3. Describe the range of career possibilities with training in chemistry.
4. Efficiently use library resources and technology to gather information and solve problems in chemistry.
5. Apply ethical principles in the domain of chemistry.

Requirements for the Major

A student majoring in chemistry is required to complete at least 48 credit hours in courses of chemistry including core courses: CHEM 250, 261, 270, 311, 320, 330, 350, 361, 370

During their Freshman and Sophomore years, students should take the following courses which will prepare them for higher level courses: CHEM 150, CHEM 160, CHEM 170 and CHEM 260. Taking these courses at the initial stages will help them to complete the degree on time with sufficient number of courses in their desired specializations.

Elective Courses: A student majoring in chemistry must take at least 16 credit hours courses from Elective Courses listed below; at least 2 courses from each category:

Inorganic-Analytical Chemistry

CHEM 413	Instrumental Methods of Analysis
CHEM 450	Advanced Inorganic Chemistry
CHEM 453	Chemical Applications of Group Theory
CHEM 454	Inorganic Electronic Spectroscopy
CHEM 455	Inorganic Reactions Mechanism

Organic-Biochemistry

CHEM 260	Principles of Organic Chemistry
CHEM 462	Spectroscopy of Organic Compounds
CHEM 464	Advanced Organic Chemistry
CHEM 465	Natural Products and Medicinal Chemistry
CHEM 430	Chemical Principles in Biology

Physical Chemistry

CHEM 271	Quantum Chemistry
CHEM 470	Polymer Chemistry
CHEM 472	Advanced Quantum Chemistry
CHEM 473	Surface and Solid State Chemistry

Requirements for the Minor

Minor in Chemistry is open to students having basic science background at Intermediate and A Levels. Students are required to take at least 24 credit hours of 200 level courses or above by selecting at least one course from each area (organic, inorganic and physical) of chemistry.

Course Descriptions

CHEM 100: Introduction to Chemistry (3+1 credits)
Open for those students who have not taken chemistry at Intermediate or A Level
Chemistry as a basic science, matter and states of matter, elements and periodicity, atomic structure, concept of mole and elementary stoichiometric calculations, acids and basis, elementary redox reactions and electrochemical cells, organic functional groups and major classes of organic compounds and their importance, and environmental aspects of chemistry.

CHEM 150: Introduction to Inorganic Chemistry (3+1 Credits)
Prerequisite: Intermediate or A Level Chemistry
Various theories of bonding including valence bond theory, molecular orbital

theory, Werner's theory, crystal/ligand field theory, three center bonds, bonding theory of metals and intermetallic compounds, bonding in electron deficient compounds, hydrogen bonding, shapes of molecules (VSEPR model).

CHEM 160: Introduction to Organic and Biochemistry (3+1 credits)

Prerequisite: Intermediate or A Level Chemistry

Bonding and structure of organic compounds, study of hydrocarbons including additions to multiple bonds and substitution reactions of benzene, petroleum products, chemistry of food and its components including carbohydrates, proteins, lipids, nutrition and caloric intake.

CHEM 170: Introductory Physical Chemistry (3+1 credits)

Prerequisite: Intermediate or A Level Chemistry

Physical states of matter: structure and physical properties of gases, liquids, and solids, Bragg's Law, intermolecular forces. Kinetic Theory of Gases: deviation from ideal behavior, Van der Waals equation, distribution of velocities, Boltzmann Distribution Law. Chemical Kinetics: rate of reaction, reaction velocity, rate laws, integrated rate law, half life of reaction, determination of order of reaction. Chemical Thermodynamics: First Law of Thermodynamics and Thermochemistry. Quantum Chemistry: development of quantum theory, wave mechanics, Schrodinger equation, wave function.

CHEM 250: Chemistry of Main Groups Elements (3+1 credits)

Prerequisite: Intermediate or A Level Chemistry

Structural characteristics, reactivities, simple compounds, coordination compounds, metal crowns, organometallic compounds of s and p block elements, noble gases and their compounds, interhalogens, pseudohalogens and polyhalides. Anomalies in periodicity, the use of d-orbitals by non-metals, reactivity and d-orbital participation, pπ-dπ bonds, multicenter bonding in electron deficient molecules, three-centre-two electron and three-center four-electron bonds.

CHEM 260: Principles of Organic Chemistry (3+1 credits)

Prerequisite: Intermediate or A Level Chemistry

Basic concepts of organic chemistry like resonance, inductive effect, isomerism including stereochemistry, geometric isomerism, acids and bases, their relative strength and factors affecting acidity and basicity, significance of pH, pka and pKb, chemistry of alcohols, phenols, thiols and ethers and their industrial applications.

CHEM 261: Organic Chemistry I (3+1 credits)

Prerequisite: CHEM 160 or CHEM 260

Reaction mechanisms including free radical, electrophillic and nucleophillic substitution, addition and elimination reactions; chemistry of alkyl halides, amines and organometallic compounds, catalytic reactions and their importance.

CHEM 270: Thermodynamics and Equilibrium (3+1 credits)

Prerequisite: CHEM 150 or CHEM 170

Chemical Thermodynamics: Second and third laws of thermodynamics, concept of entropy, Helmholtz and Gibbs Energy functions, Spontaneity and equilibrium, chemical potential, system of variable composition, interrelationship of thermodynamic functions. Phase equilibrium: Clapeyron equation, solid-liquid, liquid-gas, solid-gas equilibria, Phase diagrams, Phase rule. Solutions: Ideal and non-ideal solutions, Raoult's law, Colligative properties, Osmotic pressure, depression of freezing point, elevation of boiling point.

CHEM 271: Quantum Chemistry (3 credits)

Prerequisite: CHEM 150 or CHEM 170

Postulates of quantum mechanics, quantum mechanical operators, Schrodinger equation, wave, functions and their properties. Quantum mechanical systems: Particle in a 1 - D box, Harmonic oscillator, Rigid rotator, Hydrogen atom, Variation principle, Huckel method.

CHEM 311: Fundamental Analytical Chemistry (3+1 credits)

Open to Juniors and Seniors

Gravimetric and volumetric methods of analysis including buffers, complexometric titrations, redox titrations, non-aqueous titrations, Karl-Fischer titrations, UV/VIS spectroscopic analysis, IR Spectroscopy, treatment of measurement errors; usage and handling of standards, sampling, precision, accuracy, signal-to-noise ratio, limits of detection and quantitation, statistical evaluation of data; quality control and quality assurance.

CHEM 320: Industrial Chemistry (3+1 credits)

Open to Juniors and Seniors

Efficiency and yield, common chemical industries with special reference to Pakistan including cement, surfactants, paper and pulp, glass and ceramics, leather, metallurgies of important metals, liquid crystals and inorganic polymers. Environmental industrial impacts and industrial environmental management.

CHEM 330: Biochemistry (3+1 credits)

Prerequisite: CHEM 160 or equivalent

Detailed structure and physiological function of primary metabolites including carbohydrates, proteins, lipids and nucleic acids, nature and role of enzymes and coenzymes, metallo-proteins and enzymes, mechanism of enzyme action, kinetics and regulation of enzymes and their industrial applications.

CHEM 350: Coordination Chemistry (3+1 credits)

Prerequisite: CHEM 150 or CHEM 250

Historical background of coordination compounds, nomenclature and stability, geometry of complexes having coordination number 2 to 9, explanation of optical and magnetic properties of coordination compounds, Jahn-Teller effect, isomerism

and stereochemistry, stabilities of coordination compounds, characterization and applications of coordination compounds, metal based drugs, metal carbonyls and nitrosyls, organic reagents used in inorganic analyses.

CHEM 361: Organic Chemistry II (3+1 credits)
Prerequisite: CHEM 260 or CHEM 261
Study of carbonyl compounds including aldehydes, ketones, carboxylic acids, esters, amides, enolates and conjugate additions. Chemistry of vegetable oils and waxes.

CHEM 370: Kinetics & Mechanism (3+1 Credits)
Prerequisite: CHEM 170
Chemical Kinetics: first and second order reactions, reaction mechanism, unimolecular reactions, complex and chain reactions, theories of reaction rates, fast reactions, reaction in solutions. Electrochemistry: electrode potential, ion selective electrodes, electrochemical cells, measurement of electrode potential, electrical work, temperature dependence of cell potential, electrolysis, polarography, cyclic voltammetry, impedance. Surface chemistry: adsorption, chemisorption, heterogeneous catalysis.

CHEM 413: Instrumental Methods of Analysis (3+1 credits)
Prerequisite: CHEM 311 or CHEM 370
Atomic spectroscopic techniques: atomic absorption and emission techniques. Thermal analysis: TGA, DTA, DSC. Chromatography: introduction to separation techniques, solvent extraction, chromatography (paper, TLC, HPLC, GC, GPC) and electrophoresis. Hyphenated techniques: gas chromatography-mass spectrometry (GC-MS), liquid chromatography-mass spectrometry (LC-MS), MS-MS, LC-FTIR; inductively coupled plasma-mass spectrometry, matrix-assisted laser desorption/ionization-time of flight (MALDI-TOF) mass spectrometry, tanden mass spectrometry, ion trap mass spectrometry, other topics of interest. Nuclear techniques: Neutron activation analysis, nuclear quadrupole resonance, isotope dilution method, isotope ratio mass spectrometry, mössbauer spectroscopy, radio-immuno assay, x-ray techniques.

CHEM 421: Pharmaceutical Chemistry (3+1 Credits)
Prerequisite: CHEM 260 or CHEM 261 or CHEM 330
Types and physicochemical properties of drugs and pharmacologically active products, structure and activity relationship, drug design, metal ions as information carriers, chemistry and mode of action of some common drugs.

CHEM 430: Chemical Principles in Biology (3+1 credits)
Prerequisite: CHEM 330 or equivalent
Interconnections between chemistry, biology and underlying chemical logic of biomolecules and metabolic pathways, genes and genomics.

CHEM 440: Environmental Chemistry (3+1 credits)

Open to Juniors and Seniors

Introduction to environment, air pollution, water pollution, noise pollution, solid waste pollution and environment, ecotoxicology, hazardous waste and its management.

CHEM 442: Green Chemistry (3+1 credits)

Open to Juniors and Seniors

Green chemistry, principles, evaluating materials, feed stocks and starting materials, types of reactions in chemical transformation, evaluation of methods to design safer chemicals, green chemistry and future trends.

CHEM 450: Advanced Inorganic Chemistry (3 +1 credits)

Prerequisite: CHEM 250 or CHEM 351

Non-aqueous solvents, chemistry of carbonyl and nitrosyl compounds, lanthanides and actinides.

CHEM 453: Chemical Applications of Group Theory (3 credits)

Prerequisite: CHEM 250 or CHEM 350

Symmetry, symmetry elements and operations, point groups, matrices, group representation and character tables, reducible and irreducible representations, applications of group theory in bonding, crystal field theory and IR etc.

CHEM 454: Inorganic Electronic Spectroscopy (3 credits)

Prerequisite: CHEM 250 or CHEM 350

Electronic spectroscopy of coordination compounds, Russell-Sanders coupling scheme, derivation of term symbols of for p1-p6 and d1-d10 systems, pigeon holes diagram, magnetism, magnetic susceptibility, magnetic moments, Faraday's and Gouy's methods, orbital contribution to magnetic moment, effect of temperature on magnetic properties of complexes.

CHEM 455: Inorganic Reactions Mechanism (3+1 credits)

Prerequisite: CHEM 250 or CHEM 350

Classification of reaction mechanisms, rate laws, steady state approximation, inert and labile complexes, substitution reactions, octahedral complexes, acid hydrolysis, acid catalyzed reaction, base hydrolysis, attack on ligands, steric effects of inert ligands, square planar complexes, nucleophilic reactivity, trans-effect, cis-effect, effect of leaving group, mechanism of substitution, and racemization reactions, reactions in non-aqueous inorganic solvents, classification of solvents, types of reactions in solvents, effect of physical and chemical properties of solvent, detailed study of liquid NH3, H2SO4, HF, SO2, BrF3 and supercritical fluid (water and CO2), reactions in molten salts and ionic liquids.

CHEM 462: Spectroscopy of Organic Compounds (3+1 credits)

Prerequisite: CHEM 260 or CHEM 261 or CHEM 360

Study of IR, Mass and NMR spectroscopy as tools of structure elucidation,

functional groups identification by IR spectroscopy, fragmentation pattern of main classes of organic compounds, 1-D proton and C-13 NMR spectroscopy and fundamental 2-D NMR techniques.

CHEM 464: Advanced Organic Chemistry (3+1 credits)
Prerequisite: CHEM 260 or CHEM 261 or CHEM 360
Study of reactive intermediates, pericyclic reactions, rearrangement reactions and oxidation-reduction reactions, retro-synthesis and disconnections approach, design and synthesis of organic compounds of industrial importance.

CHEM 465: Natural Products and Medicinal Chemistry (3+1 credits)
Prerequisite: CHEM 330 or CHEM 360 or equivalent
Introduction to natural products and their medicinal importance, biosynthesis of terpenoids, alkaloids, flavonoids and steroids, total and partial synthesis of some representative natural products, chemistry of perfumes and aromatherapy, drug discovery.

CHEM 470: Polymer Chemistry (3+1 credits)
Prerequisite: CHEM 261 or CHEM 370
Introduction to polymers, step-growth, chain polymerization, copolymerization, kinetics of polymerization. Physical aspects of polymers: molecular weight, distribution, averages, and methods of determination, characterization of polymers.

CHEM 472: Advanced Quantum Chemistry (3 Credits)
Prerequisite: CHEM 271
Angular momentum, approximate methods, perturbation theory, multielectron atoms, molecular orbital calculations, computational quantum chemistry.

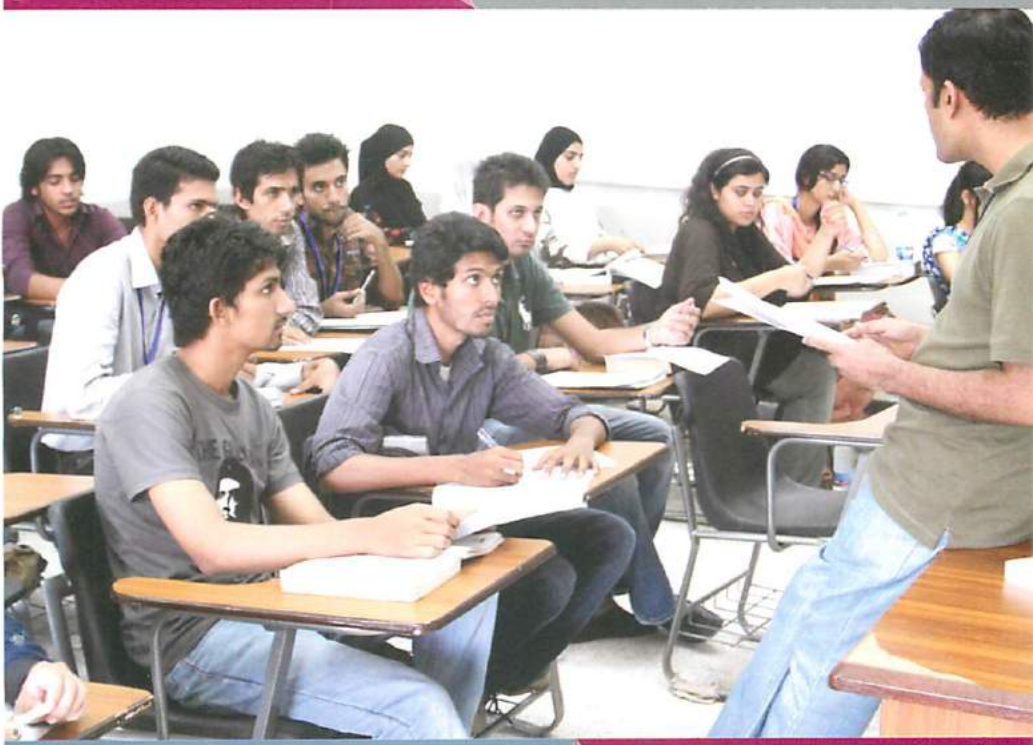
CHEM 473: Surface and Solid State Chemistry (3+1 credits)
Prerequisite: CHEM 270 or CHEM 370
Crystal structures, unit cells and Miller indices, X-ray diffraction, adsorption and desorption, Langmuir and BET isotherms, surface reactions and reactivity, ultrathin films and interfaces, techniques for the study of surfaces

CHEM 498: Industrial Training (6 credits)
Open to Junior year students intending to major in Chemistry
Junior and Senior students with a minimum 2.75 CGPA can register for this course in summers. Registered students will take an off-campus Industrial Training for 6-8 weeks in a reputed organization. At the end of the training the students need to submit a report on their work which will be evaluated by the department.

CHEM 499: Research Project (6 credits)
Open to Junior year students intending to major in Chemistry
Junior and Senior students with minimum 2.75 CGPA can register for this course in

summer. Project must be completed and research thesis submitted within 6-7 months. Viva voce will be conducted after submission of the research thesis.

15. Department of Computer Science and Information Technology



Introduction

The Department of Computer Science focuses on computing in daily lives. A number of components are studied in detail at the department, including Computer Science, Information Technology, Software Engineering, and Information Systems. Significant overlaps with a number of other fields including Telecommunications and Biotechnology are also discussed.

The Department of Computer Science offers a BSc (Hons) degree in Computing with three specializations. It belongs to the Faculty of Information Technology and Mathematics.

BSc (Hons) Computing

The 4-year BSc (Hons) degree program in Computing at Forman Christian College provides a broad understanding of the concepts, theories and techniques of a specific discipline within Computing to succeed in an entry level position in the industry or to successfully undertake further specialized study in the area. It also focuses on providing a solid understanding of the basic principles of the discipline which is sufficient to support a lifetime of self-directed learning and facilitate the acquisition of new knowledge in the field of Computer Science as advances in the discipline are made. The degree offers three specializations:

- Computer Science
- Software Engineering
- Information Technology

Learning Objectives

Computer Science Major

1. Develop theoretical foundations of computer science.
2. Perform software analysis and design.
3. Make appropriate choice of career opportunities and options after graduation.

Software Engineering Major

1. Formulate a good design which is re-usable, understandable, modular, highly cohesive and has low coupling.
2. Apply software engineering principles in software projects to yield an effective, reliable and maintainable system.
3. Provide software products which can be verified and validated.

Information Technology Major

1. Administer systems, networks and databases.
2. Implement IT security.
3. Perform information management and retrieval in databases.

Requirements for Major

All specializations require the completion of 20 computing courses and a project adding up to 64 credit hours as a major requirement.

In addition, all students must complete 47 credit hours of General Education courses and 15 credit hours of University Elective Courses from discipline(s) of their choice, as well as a Comprehensive Exam covering the core subjects and the required subjects for the particular major(s).

Introductory Workshop
All students entering the program will be expected to participate in "0s and 1s of Computing". This is an introductory workshop offered in several 2-hour blocks on weekends or after scheduled classes during the early weeks of each term, and intended to establish a basic level of skill in the use of computer-based tools (word processing, etc) and an understanding of basic computing concepts.

Core courses required: All Computing Majors must take 13 courses worth 40 credit hours including core courses COMP 102, COMP 111, COMP 113, COMP 200, COMP 206, COMP 213, COMP 220, COMP 301, COMP 303, COMP 311, COMP 350, COMP 400, COMP 401.

They must also take two courses worth 6 credit hours chosen from Programming Elective courses COMP 340, COMP 440, COMP 461, COMP 462, COMP 463, COMP 464.

Additional required courses for a Computer Science major: CSCS 302, CSCS 323, CSCS 350.

Additional required courses for an Information Technology major: CSIT 313, CSIT 421, CSIT 450.

Additional required courses for a Software Engineering major:
CSSE 313, CSSE 351, CSSE 400.

Elective courses from the computing domain: Three additional courses, chosen in consultation with the student's major Advisor, should be taken.

Course Descriptions

Core and special topic courses

COMP 102: Programming I (3 credits) (2+2)
Basic skills of problem solving and programming, problem analysis, algorithm

design, program development and testing, structured design techniques, object-oriented thought process and basic tools.

COMP 111: Programming II (3 credits) (2+2)
Prerequisite: COMP 102
Classes, inheritance, class hierarchy, polymorphism, basic data structures, analysis of algorithms, basic searching and sorting techniques.

COMP 113: Discrete Mathematics (3 credits)
Prerequisite: MATH 101 or A Level or Intermediate Mathematics
Foundations of discrete mathematics as they apply to Computer Science, understanding and appreciation of the finite nature inherent in most Computer Science problems and structures through study of Logic, Set Thoery, Functions, Recursive relations, combinatorial reasoning, iterative procedures, predicate calculus, tree and graph structures.

COMP 200: Data Structures and Algorithms (3 credits) (2+2)
Prerequisites: COMP 111, COMP 113
More sophisticated data structures and algorithms required to manipulate them, selection or construction of suitable data structures for a wide range of problems, analysis of the efficiency of chosen solutions, standard problems such as sorting and searching, time and space complexity of computer programs.

COMP 205: Introduction to Information Technology (3 credits)
Prerequisites: COMP 102, STAT 102
An overview and introduction to basic information concepts, representation and coding of information, measuring information, noisy channels and information loss, source coding and channel coding, information storage and retrieval, elementary database concepts, information transmission in practice, elementary network concepts, information presentation, elementary notions of multimedia, world wide web as a case study in information technology.

COMP 206: Hardware Logic and Design (3 credits) (2+2)
Prerequisite: MATH 101 or A Level or Intermediate Mathematics
Fundamentals of hardware system design, beginning at the digital logic level with bits, binary representations, and basic binary operations, combinational and sequential logic circuits, basic functional units, higher level computing functions, hardware description languages, basic elements of some real life architectures.

COMP 213: Database Systems (3 credits) (2+2)
Prerequisite: COMP 200
Databases, various data models, data storage and retrieval techniques and database design techniques, relational data model, the relational algebra as a basis for queries in SQL and normalization techniques to optimize database structure.

COMP 220: Software Engineering (3 credits)

Prerequisite: COMP 111

Basics of Software Engineering, the terminologies involved and various principles, methods, tools and techniques used to produce quality software, two fundamental approaches of software engineering: structural and object-oriented. Various techniques used for requirements engineering, system/software design, implementation, and testing, fundamental issues of software measurement and project management.

COMP 301: Operating Systems (3 credits)

Prerequisites: COMP 200, COMP 206

Construction and working of operating systems, understanding management and sharing of the computer resources communication and concurrency, developing effective and efficient applications, problems and issues regarding multi-user, multi-tasking, and distributed systems.

COMP 303: Design and Analysis of Algorithms (3 credits)

Prerequisite: COMP 200

Basic notions of the design of algorithms and the underlying data structures, measures of complexity, structure, complexity and efficiency of algorithms, techniques of algorithm.

COMP 311: Computer Networks (3 credits)

Prerequisites: STAT 102, COMP 301

Engineering concepts underlying computer communication, including analogue and digital transmission, circuit switching and packet switching, logical network structure and operation including network layers, network models (OSI, TCP/IP) and protocol standards, understanding of modern network concepts.

COMP 340: Web Application Development (3 credits) (2+2)

Prerequisites: COMP 213, COMP 220

Concepts, methods, technologies, and techniques of developing web applications that collect, organize and expose information resources, web application architectures, design methods and technologies, interface design, usability of web applications, accessibility, testing metrics, operation, deployment and maintenance of web applications and security, current and future web technologies.

COMP 350: Object-Oriented Analysis and Design (3 credits)

Prerequisite: COMP 220

Exploitation of the rich object-oriented modeling provided by Unified Modeling Language (UML), adaptation to changing requirements with iterative techniques and component-based design, design solutions optimized for modern object-oriented languages and platforms, application of proven design patterns, design heuristics, anti-patterns and refactoring techniques to refine analysis and design models, construction of unit and system tests to verify implemented designs.

COMP 400: Senior Project (6 credits, 2 semesters, 3 credits each semester)
Prerequisites: COMP 213, COMP 220, Senior standing
Requires students to research, conceive, plan and develop a real and substantial project related to computer science over the course of two semesters. It provides an opportunity to students to realize their acquired professional competence in the form of a demonstrable software product or other tangible result. The students must also make an oral and written project presentation.

COMP 401: Ethics for Computing Professionals (1 credit)
Prerequisite: COMP 220
Introduction to ethical questions faced by designers, developers, managers and users of information systems including intellectual property rights, privacy concerns, professional responsibilities and deliberate destructive use of IT resources.

COMP 440: Systems Programming (3 credits) (2+2)
Prerequisites: COMP 301, CSCS 323
Internal operation of system software including assemblers, loaders, macro-processors, interpreters and inter-process communication.

COMP 461: Advanced Database Programming (3 credits) (2+2)
Prerequisites: COMP 213
Advanced nested and join queries, database procedures and functions, complex database programming problems, optimization of queries, distributed database systems, distributed transactions, advanced data models, concurrency control techniques.

COMP 462: Advanced Software Architecture and Programming (3 credits) (2+2)
Prerequisites: COMP 311
Software architecture and programming of enterprise systems, web services, MVC architecture, AJAX, naming and directory services, messaging based architectures, RPC/RMI, CORBA and other advanced architectures popular in industry.

COMP 463: Mobile Application Development (3 credits) (2+2)
Prerequisites: COMP 301
Programming of applications for mobile phones and mobile devices such as tablets in a popular mobile device platform and programming language.

COMP 295/495: Special Topics in Computing (1-3 credits)
Prerequisites: As appropriate for the material
These courses allow the presentation of new or emerging areas of study in the computing domain.

Computer Science Specialization

CSCS 100: Introduction to Computing (3 credits)
Not open to students registered in the BSc Computing
Introduction to computing environments, general application software, computing hardware, operating systems, desktop publishing, internet, software applications and tools and computer usage concepts, introduction to software engineering and information technology within the broader domain of computing.

CSCS 302: Theory of Automata (3 credits)
Prerequisite: COMP 200
Mathematical models of computation, definition and properties of formal languages and grammars, finite automata, regular languages and regular expressions, pushdown automata and context free languages, pumping lemmas and normal forms, Turing machines, Church's Thesis, Halting Problem and undecidability, overview of the theory of computational complexity.

CSCS 310: Numerical Analysis (3 credits)
Prerequisite: MATH 102 or MATH 103
Identical with MATH 310 -- Students may earn credit in only one of the two courses
Introduction to computer representation of numbers, error analysis, roots of equations, nonlinear and linear simultaneous equations, matrices, determinants, numerical integration, solutions of ordinary differential equations, interpolation and curve-fitting, implementation using a suitable computer language.

CSCS 323: Computer Organization with Assembly Language (3 credits)
Prerequisites: COMP 111, COMP 206
Introduction to computer systems and usage of assembly language for optimization and control, low-level logic employed for problem solving while using assembly language as a tool, writing moderately complex assembly language subroutines and interfacing them to any high level language.

CSCS 350: Introduction to Artificial Intelligence (3 credits)
Prerequisite: COMP 200
Computational tools and techniques which mimic the human decision-making process and capability.

CSCS 403: Graph Theory (4 credits)
Identical with MATH 403 -- Students may earn credit in only one of the two courses
Graphs, sub graphs, isomorphism, trees, connectivity, Euler and Hamiltonian properties, matching, vertex and edge colorings and planarity.

CSCS 451: Compiler Construction (3 credits)
Prerequisite: CSCS 302
Organization of compilers, different types of translators, lexical and syntax analysis,

CSCS 452: Computer Architecture (3 credits)
Prerequisites: COMP 301, CSCS 323
Design and evaluation of modern uni-processor computing systems, evaluation methodology/metrics, instruction set design, advanced pipelining, instruction level parallelism, prediction-based techniques, alternative architectures, memory hierarchy design and I/O.

CSCS 453: Computer Graphics (3 credits)
Prerequisites: COMP 200, MATH 103
Graphics hardware including display devices, applications of computer graphics, development of graphics software, interactive graphics programming, Raster scan, conversion algorithms for Line segments, circles, ellipses and general curves, 2D transformations, windowing and clipping including panning and zooming, line clipping and area clipping algorithms, region filling algorithms, 3D objects display techniques, 3D representations, 3D transformations, curve and surface design and representations, rendering, shading and animation.

CSCS 455: Data Mining and Data Warehousing (3 credits)
Prerequisite: COMP 213
Database concepts, different data models, data storage and retrieval techniques and database design techniques, data warehousing and data mining, emerging database technologies and applications.

CSCS 457: Computer Vision (3 credits)
Prerequisites: CSCS 350, MATH 103
Introduction of theory and applications of computer vision and current problems, techniques and applications, computer vision systems, interaction of different components in a complete system, writing programs to solve computer vision problems, through the use of several programming assignments and examples.

CSCS 461: Principles of Programming Languages (3 credits)
Prerequisite: COMP 200, CSCS 302
Theory and practice of programming language translation, languages, grammar and parsing, lexical, syntactic and semantic analysis, compiler-time error handling, organization of programming languages including language processors, syntax data types and sequence control, storage management, comparison of language features from the functional, imperative, logical and object-oriented paradigms.

CSCS 464: Visual Programming (3 credits) (2+2)
Prerequisite: COMP 200
Introduction to graphical user interface (GUI) based programming and event driven paradigm, X language foundation classes/framework, application wizard and application studio, user interface controls, developing custom controls, graphics device interface, application architecture, files and serialization.

Software Engineering Specialization

CSSE 313: Software Requirements Engineering (3 credits)
Prerequisite: COMP 220
Role of requirements engineering within the software life cycle, comparison, contrast and evaluation of structured, object-oriented, data-oriented and formal approaches to requirements analysis, gathering necessary requirements from a customer to develop specifications and software.

CSSE 351: Software Quality Assurance (3 credits)
Prerequisite: COMP 220
Quality assurance and verification, avoidance of errors and other quality problems, inspections and reviews, testing, verification and validation techniques, process assurance vs product assurance, quality process standards, product and process assurance, problem analysis and reporting, statistical approaches to quality control.

CSSE 400: Software Projects Management (3 credits)
Prerequisite: CSSE 351
Planning and managing software development projects successfully maximizing the return from each stage.

CSSE 405: Human Computer Interaction (3 credits)
Prerequisite: COMP 220
Identical with CSIT 400 -- Students may earn credit in only one of the two courses
Exploration of the differences in information processing by humans and machines using insights from Psychology and cognitive science, design of human-computer interfaces and systems involving both human and computer components.

Information Technology Specialization

CSIT 210: Introduction to Multimedia (3 credits)
Prerequisite: CSCS 100 or COMP 205
Introduction to multimedia, different media types and their uses, range of applications of multimedia, selection of tools available for the production of multimedia applications, hands-on practice in the production of simple multimedia applications.

CSIT 311: Network Management and Security (3 credits)
Prerequisite: COMP 311
Overview of data communication and network management and security.

CSIT 312: System and Network Administration (3 credits)
Prerequisite: COMP 311
Tools and techniques used in the administration and management of computing

computing systems and networks, file systems and directory permission structures, user account administration, client administration, remote access and remote administration, run levels and services, network services configuration, defining security, firewalling, defending against malicious users.

CSIT 313: Database Administration (3 credits)
Prerequisite: COMP 213
Installation and configuration of database systems, database backup and maintenance, performance analysis, monitoring and tuning, access control and user management, management of competing applications.

CSIT 400: Human Computer Interaction (3 credits)
Prerequisite: COMP 220
Identical with CSSE 405 -- Students may earn credit in only one of the two courses
Exploration of the differences in information processing by humans and machines using insights from Psychology and cognitive science, design of human-computer interfaces and systems involving both human and computer components.

CSIT 401: Geographic Information Systems (3 credits)
Prerequisite: COMP 311
Intermediate and advanced topics in geographic information science and spatial analysis using GIS software, GIS theory, technology and applications, relationship between GIS and remote sensing.

CSIT 411: Wireless Networks (3 credits)
Prerequisite: COMP 311
Techniques in design and operation of first, second and third generation wireless networks: cellular systems, medium access techniques, radio propagation models, error control techniques, handoff, power control, common air protocols, radio resource and network management.

CSIT 421: Information Security (3 credits)
Prerequisite: COMP 311
Introduction to information security from a theoretical and practical perspective, details of different security vulnerabilities of information systems and computer networks, methods to defend against the attacks for vulnerabilities exploited by adversaries and hackers, cryptographic techniques and protocols, network security protocols and practices, digital signatures and authentication protocols and wireless network security.

CSIT 450: Technology Management (3 credits)
Prerequisite: COMP 220
Introduction to technology strategy, corporate strategy, technology transfer, technology strategy development, product development strategy and innovation process.

16. Department of Economics

Introduction

Since 1915, the Department of Economics at Forman Christian College has been offering the undergraduate program. The department has evolved over time, bringing it up to par with contemporary needs. Currently there are over 400 Baccalaureate students majoring in Economics and it is rated as one of the most popular degree programs for students at FCC. The department is part of the Faculty of Business & Economics.

BSc (Hons) Economics

The program provides a thorough understanding of economic theories pertaining to global economic issues and their impact on Pakistan's economy. It also enables the students to perform quantitative analysis, research and effectively present their results. The degree facilitates students to become accomplished professionals who can contribute towards policy formulation.

Learning Objectives

1. Demonstrate understanding of microeconomics, macroeconomics and econometrics.
2. Perform quantitative and research skills to critically analyze economic issues.
3. Apply economic theory in a wide range of real life problems and suggest policy changes.
4. Effectively communicate economic ideas in oral and written form.
5. Use their knowledge and abilities for the welfare of the people.
6. Practice ethical and moral values in their professional and personal lives.
7. Describe careers that apply economics in public, private, and international institutions.

Requirements for the Major

A minimum CGPA of 2.30 is required to declare Economics as a major.
Students take eight core courses and eight elective courses out of 17 elective courses.
Minimum six elective courses of 300 or 400 levels are required for majoring in Economics.

Core Courses: Econ 101, 102, 103, 201, 202, 203, 300, 302.

Elective Courses: Econ 206, 303, 307, 309, 311, 313, 315, 400, 402, 403, 406, 407, 408, 411, 413, 417, 422.

Course Descriptions

ECON 100: Basic Economics (3 credits)
Economics Juniors and Seniors are not allowed to register for this course. Students who have not studied Economics at Intermediate or A Level, should register for this course before ECON 101 and ECON 102.

Students who have passed ECON 101 and/or ECON 102 are not allowed to register for this course. This course is counted towards General Education credits.
Basic concepts of Economics such as demand, supply, allocation of resources, opportunity cost, national income, inflation, unemployment, international trade and development economics.

ECON 101: Microeconomics I (3 credits)
Students cannot register for this course with or before ECON 100.
Basic method and subject matter of microeconomics, consumer behavior theory, producer theory, cost theory, output and price strategies under perfect and imperfect competition market structure.

ECON 102: Macroeconomics (3 credits)
Students cannot register for this course with or before ECON 100.
Key macroeconomic concepts, national income accounting, productivity, standard of living, growth and public policy issues, introduction to consumption, saving and capital formation, inflation, unemployment, monetary system, quantity theory of money, introduction to monetary and fiscal policies.

ECON 103: Mathematics for Economists (3 credits)
Basic tools of mathematical economics and their application to economic analysis, nature of mathematical economics, real number system, set theory and economics, comparative static analysis, linear models and matrix algebra, tools of algebra and calculus, application of calculus in economics, optimization of one and multivariable functions, optimization with constraints, and economic application of optimization.

ECON 201: Microeconomics II (3 credits)
Prerequisite: ECON 101 and 103
Continuation of Microeconomics I using mathematical models to analyze consumer theory, producer theory, firm behavior under perfect and imperfect market structure, input markets with both perfect and imperfect competition.

ECON 202: Macroeconomics II (3 credits)
Prerequisite: ECON 102 and 103
Classical and Keynesian economic theory policy, derivation of AD and AS models and their implication for stabilization policies, short term and long term inflation-unemployment relationship, consumption and investment theories and economic growth, growth accounting and convergence.

ECON 203: Statistics for Economists (3 credits)
Application of statistics tools in economics, basic concepts and terminology of statistics, presentation of data, measures of central tendency, dispersion, shape and relationship, probability and probability distributions, random variables, probability density function of discrete and continuous random variables, joint, marginal and conditional

probability density functions, Bernoulli Binomial, Binomial, Poisson, Normal, $\chi 2$, t, F, definitions, properties and their relationship, sampling and sampling distributions, statistical inference: estimation and testing of hypothesis.

ECON 206: Banking and Finance (3 credits)

Prerequisite: ECON 102

Concepts of conventional and interest free banking, financial system, credit creation, financial institutions and instruments, interest free Islamic banking and finance, principles of Islamic banking and finance, financial contracts, modes of financing, and contractual mechanisms.

ECON 300: Fundamentals of Econometrics (3 credits)

Prerequisites: ECON 201, ECON 202, ECON 203

Regression analysis and ordinary least squares, dummy variable regression models, relaxing the assumption of classical model, multicollinearity, heteroskedasticity, autocorrelation, right hand-side endogenous variables, WLS and GLS, model specification and diagnostic testing.

ECON 302: Research Methods and Computer Applications (3 credits)

Prerequisite: ECON 300

Methods and methodologies of research used in Economics, techniques of investigation, data collection methods, research design, sampling, report writing and use of econometric software.

ECON 303: Environmental Economics (3 credits)

Prerequisite: ECON 101

Introduction to the economic and ecological principles essential for a clear understanding of contemporary environmental and natural resource management issues, integrated understanding of the field combining economic, legal and ecological perspectives to better understand the causes and solutions to market failure and environmental degradation, economic efficiency and market failure, property rights, externality, measuring social welfare and welfare improvements, demand for environmental goods, environmental valuation methodologies, environmental benefit-cost analysis and other making criteria, environmental policy and environmental regulations, common pool resource management, depleteable resource management.

ECON 307: International Trade Theory and Policy (3 credits)

Prerequisite: ECON 201

Evaluation of International Trade: international trade theories and international trade policies. Mercantilists' views on trade and theories like classical theories (absolute & comparative advantage), standard theory of international trade, neo-classical trade theory, offer curve and terms of trade, factor endowments and Heckscher-Ohlin model, factor price equalization and Stolper-Samuelson theorems, H-O Model and new trade theories, trade based on economies of scale, product differentiation, technological gap

ECON 309: Econometric Methods (3 credits)
Prerequisite: ECON 300
Econometric models and estimation problems that often arise in economic application, nonlinear regression models, approaches to estimating nonlinear models, qualitative response regression models, LPM, Logit, Probit, panel data regression models, fixed effect approach and random effect approach, simultaneous-equation models, simultaneous equation bias, identification problem, approaches to estimation (ILS, 2SLS).

ECON 311: Development and Growth Economics (3 credits)
Prerequisite: ECON 202
Theory and history of economic growth and development, economic institutions and development, diverse structures and common characteristics, measurement of classic and modern economic development models, economic development and issues of poverty, inequality, population, urbanization, education and health, agriculture and rural development, growth models of Harrod-Domer, Solow-Swan, Kaldor and Joan Robinson, and new growth theories.

ECON 313: Monetary Theory (3 credits)
Prerequisite: ECON 202
Determinants of demand and supply of money and role of financial institutions, nature of monetary economics, money supply process and definition of monetary aggregates, theories of money demand, microeconomic determinants of demand for money, testing the demand for money, weakness of the link between the theory of the demand for money and the testing of it, monetary transmission mechanism, price surprises, central banking and the money supply.

ECON 315: Advanced Mathematical Economics (3 credits)
Prerequisite: ECON 103
Dynamics and integral calculus, definite and indefinite integral, proper and improper integral, economic application of integration, difference equations, differential equations and their economic applications, linear programming, non-linear programming, Khun-Tucker conditions and optimal control theory with applications.

ECON 400: Issues in Pakistan Economy (3 credits)
Prerequisite: ECON 202
Leading issues in the Pakistan economy, political economy, growth, income distribution and poverty, state of inflation and unemployment, growth and development issues of major sectors, fiscal and monetary policy, balance of payments and budget deficit, foreign trade and aid, internal and external debt, money and capital markets, and human resource development.

ECON 402: Project Planning and Appraisal (3 credits)
Prerequisite: ECON 201
Project planning, its process, appraisal and evaluation with special reference to

Pakistan, technical, social, financial and economic analysis of projects, discounted measures of project worth i.e. BC Ratio, IRR, NPV etc., techniques used in time and resource management like CPM, PERT and WBS, project monitoring and sensitivity analysis, analysis of mega projects in Pakistan like Gwadar Deep Water Port, Lahore-Islamabad Motorway etc.

ECON 403: Time Series Econometrics (3 credits)

Prerequisite: ECON 300

Time-series techniques in economics, dynamic econometric models, autoregressive and distributive lag models, estimation of autoregressive, causality in economics, approaches to economic forecasting, ARMA and ARIMA modeling and estimation, measuring the volatility in financial time series, ARCH and GARCH models, vector auto-regression (VAR), co-integration and error correction modeling.

ECON 406: Introduction to Game Theory (3 credits)

Prerequisite: ECON 201

Analytical tools to understand consequently predict behavior in multi-person decision settings,definitions and rules of games, games with perfect certain, symmetric and complete information, mixed and continuous strategies, dynamic games with symmetric and asymmetric information, moral hazard and adverse selection, principal agent models, cooperative and non cooperative games.

ECON 407: Research Project and Paper Writing (3 credits)

Prerequisite: ECON 302 and CGPA ≥ 3.3

Students will conduct a research project under the prearranged supervision of a faculty member of the department on a topic of economic significance. The student will have a viva-voice examination before a committee.

ECON 408: Internship (6 credits)

The internship is offered to the Juniors/Seniors with CGPA 3.00 or higher.

Credit will be granted for a full time internship of at least six weeks during summer vacations. Internship credit is not retroactive and must be prearranged with the Chairperson of the department. The students must provide verification of the completion of internship on institution's letterhead from the head of the institution not later than one week after such completion. The grading for internship will be done by the Chairperson on the basis of the written report by the student.

ECON 411: Development Policy (3 credits)

Prerequisite: ECON 311

International debt, aid/assistance, debt crises and BOP, resource mobilization and industrialization, rural development and migration, agricultural vs industrial development, human capital and its development, development and crises, poverty and income distribution, environment and development.

ECON 413: Monetary Policy (3 credits)

Prerequisite ECON 313

Introduction to monetary policy, policy goals and instruments, monetary policy and macroeconomic models, monetary policy coordination, Tobin tax, market constraints and policy analysis in Keynesian models, monetary policy and inflation targeting, optimal policy with endogenous contracts

ECON 417: International Finance (3 credits)

Prerequisite: ECON 202

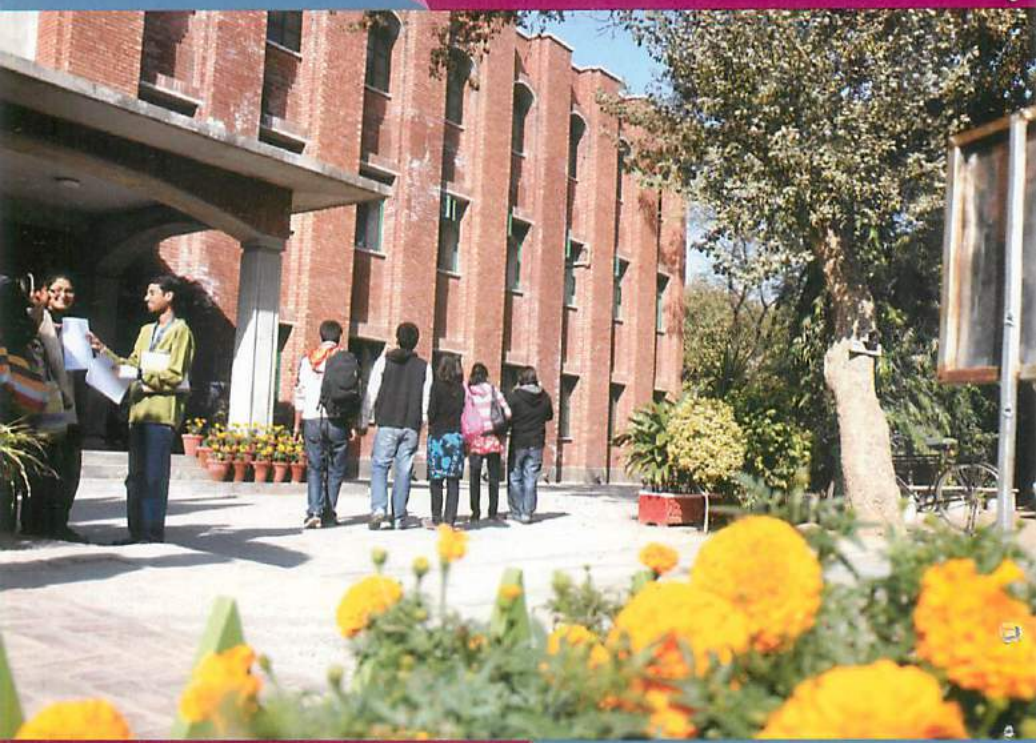
Balance of payments (BOP), foreign exchange markets, exchange rates, purchasing power parity theory, monetary approach to the BOP and exchange rates, elasticity approach to BOP, asset market model of exchange rates, macroeconomics of open economy and international monetary system, adjustments in BOP under fixed and flexible exchange rate systems, various adjustment policies to remove internal and external balances, impact of different policies (fiscal & monetary) on open economy through aggregate demand and aggregate supply curves under different exchange rate systems, evaluation of European Monetary and International Monetary Systems.

ECON 422: Macroeconomics Analysis (3 credits)

Prerequisite: ECON 202

New-Keynesian, new-classical foundations and debate, Open Economy, Mundell-Fleming Model rational exceptions, Economic fluctuations and its sources in open economy, Fiscal-Monetary policy and economic stability, Catastrophe theory, random walk, real business cycle theory, dynamic consumption, investment, government debt and Ricardian equivalence.

17. Department of Education



Introduction

Forman Christian College's Department of Education was revamped in 2003 when the college returned to private ownership. It is gaining a reputation for being one of the finest Education Departments in the country. It offers 4-year BA (Hons) and BSc (Hons) degrees in Education as well as a Certificate in English Language Teaching and an Advanced Diploma in English Language Teaching.

Our mission is to send out into the field teachers who are fully prepared to meet the challenges of teaching in a constantly changing 21st century.

BA/BSc (Hons) Education

The BA(Hons) and BSc (Hons) degrees follow a liberal arts education framework. This provides every student the opportunity to explore the breadth of knowledge by taking courses in varied disciplines to fulfill the general education requirements and be better prepared to face the world. In addition it provides every student the opportunity to explore in depth the field of education as their area of concentration.

Graduates from this program are well prepared to face the challenges of the real classroom and impact young lives as they teach. A unique feature of this program is a full semester of teaching practice during the final year which provides the student-teacher with a real-world classroom experience. The student-teacher works in close association with the cooperating teacher at the school and the Advisor from FCC. It helps the prospective teacher visualize his/her career. Our education graduates make a difference: they TEACH!

Learning Objectives

1. Explain and critique the teacher's role in the progress of a nation.
2. Develop and use appropriate teaching approaches, strategies, and skills depending on grade level and content area.
3. Cater to the learning needs of all students in mixed ability classrooms.
4. Interact ethically with students, parents, administrators, colleagues, and the wider community.
5. Practice core values in varied academic and other situations.
6. Evaluate education literature in order to explore opportunities in the field: teaching, research, counseling, administration.

Requirements for the Major

For a BA (Hons) in Education: 47-48 credits of General Education, 24 credits in the content area of Education courses (15 credits in the core courses, 9 credits in Education electives) and 12 credits of Student Teaching Experience. A total of 36 credits in Education are required.

For a BSc (Hons) in Education: 47-48 credits of General Education, 36 credits in the content area of Education courses (15 credits in the core courses, 21 credits in the Education electives) and 12 credits of Student Teaching Experience. A total of 48 credits are required.

Core Education courses: EDUC 110, EDUC 120, EDUC 300, EDUC 350, EDUC 430 (Student Teaching Experience 12 credits) and EDUC 440.

Course Descriptions

UNIV 100: Foundations of University Education (3 credits)
Prerequisite: LANG 110 (or exemption from the Language Program)
This course is especially designed for university freshmen. All entering students must take UNIV 100 during their first semester or after they have finished the LANG program. This course helps them to make the best use of their years of university study at FCC. Each student will become more aware of his or her strengths and weaknesses in learning by working on a variety of skills. By examining their values and developing learning strategies this course will help students become successful in FCC's liberal arts program. Transfers with 60 or more credits are exempt.

EDUC 110: Foundations of Education (3 credits)
Perspectives on economic, cultural, political, ideological, philosophical, aesthetic and psychological foundations of education, history of education in Pakistan.

EDUC 120: Educational Psychology (3 credits)
Principles of Psychology as applied to the educational process, characteristics of the individual learner, the teacher, the classroom, methods and other relevant factors in the learning process, various stages of growth and development, brief introduction to psychological measurements and creativity in children.

EDUC 210: Education Policies of Pakistan
Prerequisite: EDUC 110
Various education policies of Pakistan, analyses of the successes and failures of each with identification of probable causes, analysis of policies at the preschool, elementary, secondary, higher education and teacher education level.

EDUC 240: Technology in Education (3 credits)
Prerequisite: EDUC 110
Hands-on experience with computers and other technological applications in education, ways of integrating technology and the use of the internet with classroom teaching procedures in the content areas will be explored.

EDUC 260: Teaching Exceptional Children (3 credits)
Prerequisites: EDUC 110, EDUC 120
Introduction to the teaching of exceptional children either exceptionally intelligent or

with difficulties, strategies for use in a regular classroom setting, methods of identifying disabilities and giftedness, ways of finding available resources to facilitate the learning process.

EDUC 300: Instructional Methods and Strategies (3 credits)
Types of instructional methods and assessment strategies and best uses of each, discussions and practice in choosing and planning for the appropriate instructional methods, classroom arrangements and management for each instructional method.

EDUC 310: Curriculum Development (3 credits)
Prerequisite: EDUC 110
A perception of what curriculum is as a progressive activity in the student's and teacher's lives, an international vision of curriculum and its wider application in global society.

EDUC 315: Learning Theories (3 credits)
Prerequisite: EDUC 110
Cognitive development, learning facilitation, social perspectives and intelligence, works of Maslow, Pavlov, Skinner, Erikson, Piaget, Vygotsky, Bruner, Wiener, Gagne and Gardner.

EDUC 320: Introduction to Research Methods in Education (3 credits)
Prerequisites: EDUC 110 and one from STAT 100, STAT 101 or STAT 102
Concepts and methods in research as applied to education, quantitative and qualitative research, criteria and procedures for selecting a problem, research methodologies with application for real life.

EDUC 330: Educational Measurement and Evaluation (3 credits)
Prerequisites: EDUC 110 and one from STAT 100, STAT 101 or STAT 102
Concepts of measurement as they apply to testing and to the construction and evaluation of testing instruments, an understanding of how to participate competently in educational decisions related to measurement and testing.

EDUC 340: Early Childhood Education (3 credits)
Prerequisites: EDUC 110, EDUC 315
Areas of early childhood development including theories of development, discipline and guidance, instructional methodologies for pre-school children.

EDUC 350: Classroom Management (3 credits)
Understanding of the dual roles of the teacher as an instructor and manager, strategies from various approaches in order to provide a rich repertoire of management choices, proactive, responsive and supportive classroom management strategies.

EDUC 360: Teaching Science at the Elementary Level (3 credits)
Prerequisites: EDUC 110, 8 hours of laboratory based science courses
Curriculum concepts, methods and materials for teaching science, the discovery or constructivist approach of teaching science.

EDUC 365: Teaching Science at the Secondary Level (3 credits)
Prerequisites: EDUC 110, 8 credit hours of lab-based science courses
Methods and techniques specific to teaching Biology, Chemistry and Physics to the secondary grades, a hands-on approach.

EDUC 370: Teaching Language Arts at the Elementary Level (3 credits)
Prerequisites: EDUC 110, EDUC 373
Development of skills in reading, writing, speaking and listening from Class 1 through Class 8, standards for each area in each year, planning classroom management and methods for incorporating language arts across the curriculum and the use of workshops for teaching language arts.

EDUC 373: Teaching Reading (3 credits)
Prerequisite: EDUC 110
Methods of teaching reading, classroom management for teaching individuals and small groups, methods of assessment for determining reading levels and progress of students, flexible grouping and scheduling for a variety of school situations and age groups.

EDUC 375: Writing, Listening (3 credits)
Prerequisites: EDUC 110, 9 credit hours of English/Urdu language
Methods and techniques with an integrated approach to reading, writing, listening and speaking.

EDUC 380: Teaching of Mathematics at the Elementary Level (3 credits)
Prerequisites: EDUC 110, 6 credit hours of Mathematics
Preparation in the teaching of Mathematics and components of Mathematics at the elementary level, organizing content, methodology and preparation of support materials.

EDUC 385: Teaching Mathematics at the Secondary Level (3 credits)
Prerequisites: EDUC 110, 6credit hours of Mathematics courses
Teaching Algebra, Geometry and Trigonometry, useful training in the subject content, instructional methodology and preparation of support materials.

EDUC 390: Teaching Social Studies at the Elementary Level (3 credits)
Prerequisites: EDUC 110, 3 credit hours in History, Geography, or Civics
Conceptual frameworks and insights into the effective teaching of History and Geography at elementary level.

EDUC 395: Teaching Social Studies at the Secondary Level (3 credits)
Prerequisites: EDUC 110, 6 credit hours in History, Civics, or Geography
Conceptual frameworks and insights into the effective teaching of History and Geography at secondary level.

EDUC 420: Senior Research Project (3 credits)
Prerequisites: EDUC 110, EDUC 320
Students will select a problem from the field of education and go through the process of educational research under the guidance of a mentor. Research findings will be applied to actual scenarios.

EDUC 430: Student Teaching Experience (12 credits)
Prerequisites: EDUC 110, EDUC 120, EDUC 300, EDUC 350
Co-requisite: EDUC 440
An extended field-based course with real-life experience in the classroom. All aspects of the teaching-learning process will be looked at from a practical perspective.

EDUC 440: Senior Seminar in Education (3 credits)
Prerequisite: EDUC 110
Co-requisite: EDUC 430
Discussion-based course for education majors who are completing their student-teaching experience. Discussion to be based on current trends in education and questions arising from their teaching experience. Current trends in education and questions and concerns arising from student-teaching experiences.

18. Department of English

Introduction

The Department of English started in the late 1880s as a pioneer in the educational systems of the Punjab. Renowned scholars like Prof Rev H. D. Griswold, his son, Dr Griswold, Dr F M Velte, Dr E. J. Sinclair, Dr S. L. Sheets, Prof Eric Cyprian, Prof Z. Bede, Prof Talat Mehmood and Prof Gillani Kamran became the part of this department. The graduates of English Department have served the united India and Pakistan in different capacities such as top bureaucrats, judges, lawyers, diplomats, writers, poets, politicians, and entrepreneurs. Its students have won positions in the Punjab University and played prominent roles in both public and private domains.

The department offers a BA (Hons) degree in English and is part of the Faculty of Humanities.

BA (Hons) English

The Baccalaureate program trains the students for lifelong effective communication in English. It teaches them to connect literature with history, theology, culture, and civilization and interpret them in the perspective of liberal education. The main objectives are to broaden the vision of students, to enlighten their minds, and to give them deep insight into literature. This program opens various options for English majors and prepares them for pursuing postgraduate research in language and literature within and outside Pakistan. They also have the option of joining various careers such as, newscasting, teaching, civil services, law, journalism, editing, creative writing and publishing.

Learning Objectives

1. Reading: students as active readers will express their appreciation for ambiguity and interpret multiple perspectives.
2. Writing skills and process: students will write for a variety of professional and social settings. They will revise for content and edit for grammatical and stylistic clarity.
3. Culture and history: students will appraise the diversity of literary and social voices within – and sometimes marginalized by – major traditions of literature.
4. Critical approaches: students will read works of literary, rhetorical, and cultural criticism, and apply ideas form these texts in their own reading and writing.
5. Research skills: students will identify topics, formulate questions for productive inquiry, use appropriate methods and sources for research, evaluate critically the sources they find, and employ their chosen sources effectively in their own writing.
6. Values: students will demonstrate integrity by writing plagiarism-free academic papers, and will also abide by the FCC core values.
7. Oral communication skills: students will design, organize, and deliver an engaging oral presentation.

Requirements for the Major

36 credit hours including ENGL 201, ENGL 301, ENGL 303, ENGL 307, ENGL 401, ENGL 404.

The remaining courses will be chosen from the given list depending on personal interests and career goals.

Requirements for the Minor

A minor in English is open to students from all the disciplines of FCC University with the minimum CGPA of 2.50.

Core courses required:

ENGL 201 and five courses from ENGL 104, ENGL 200, ENGL 213, ENGL 214, ENGL 309, ENGL 310, ENGL 311.

Course Descriptions

LANG 100: Language Skills I (12 credits)
BICS (basic interpersonal communication skills) in English, daily practice in the use of all four language skills, ways to improve vocabulary and comprehension.

LANG 110: Language Skills II (12 credits)
BICS (basic interpersonal communication skills) in English with advanced levels of practice, varied materials to improve skills for better comprehension along with fluency and competence.

ENGL 101: Basic Writing Skills (3 credits)
Teaching of English language through integrated skills (reading, writing, listening, speaking), training students to write coherent paragraphs by practicing short narrative, descriptive, expository and argumentative, essay writing.

ENGL 102: Communication Skills (3 credits)
Develops practical communication skills through reading, writing, listening and speaking in real-life situations. One of the major objectives of this course is to stimulate students to think about what, why and how they communicate. Emphasis is on verbal and non-verbal messages, identifying the main ideas of conversations, lectures and other spoken texts, deriving the meaning of new words from the context, note-taking skills for participating successfully in social conversation and academic discussions, interactive and effective listening, negotiation for meaning, giving effective presentations, conducting seminars, chairing and participating in meetings, and writing emails, letters, memos, CVs, job applications and reports.

ENGL 103: Advanced Writing Skills (3 credits)
Proficiency in the skill of academic writing through research, development of a well-argued and well-documented academic paper with clear thesis statement, critical thinking, argumentation and synthesis of information, using citations and bibliography.

ENGL 104: History of Literature (3 credits)
Overview of various ages and movements, from Medieval to Contemporary, that have shaped Literature in English across the globe. Special attention will be given to definitions of literary periods, the emergence and transformations of canons, and the role of culture, society, and institutions in the interpretation of texts.

ENGL 201: Introduction to English Literature
This course is a prerequisite for all of the core courses/requirements of English major and minor
Basic questions regarding the nature and function of English literature that is now described as 'literatures' in English. Traces, in the simplest possible way, the significant elements and components of English literature and its various genres as they develop systematically along its history, and also explores the practical and critical aspects that address its abstract aesthetics.

ENGL 204: English Prose I (3 credits)
Familiarizes students with a variety of non-fictive prose works. The range includes a selection of essays, letters, speeches, diaries and memoirs written between 18th to 20th centuries by British and American writers, intellectuals, political and historic figures. Through these works students develop critical understanding of various socio-political, religious and cultural issues.

ENGL 207: Media and Literature (3 credits)
Introduces media as a means of understanding literature and offers a comparison between media and literature and the effectiveness of one over the other. Major emphasis on representation of literature through media, with particular focus on adaptation theory.

ENGL 213: Sociolinguistics (3 credits)
Focuses on the topics of language and culture, language and identity, diglossia, code switching, bilingualism and monolingualism, pidgin, Creole, lingua franca, language and power, language planning, orality and speech, and speech communities. Discusses the relationship of this subject with other social sciences and the relationship between language use and social factors such as region, gender, age, ethnicity, covering basic theoretical models and methodologies.

ENGL 214: English Novel: A General Survey (3 credits)
Explores the different important aspects and social, moral and economic themes related

to English culture and society in the English Novel from the 18th to 20th century. Students understand, analyze and compare different thematic issues raised by British novelists in different ages. Authors included are Daniel Defoe, Samuel Richardson, Henry Fielding, Jane Austen, Emily Brontë, Thomas Hardy, George Eliot, Oscar Wilde, Henry James, E M Foster, William Golding, Joseph Conrad and Virginia Woolf.

ENGL 216: Language and Literature (3 credits)
Reading literature in English to understand its use of English language structure, vocabulary and grammar. Explores the language of literature, finding how the words work and looks into the seminal connections formed between languages and literature.

ENGL 221: Classical Literary Criticism (3 credits)
Traces the role of classical literary criticism and its vitality regarding notions, concepts and literary terms in English literature. Also covers some salient features of early critical thought processes that complement the creative writing process.

ENGL 301: The 19th Century English Novel (3 credits)
Through a close study of 19th century British novel, this course discusses British culture, literature and history. Enables students to explore changes in themes, ideas and approaches towards social, economic and national issues in English culture by studying prominent authors like Emily Brontë, Charlotte Brontë, George Eliot and Thomas Hardy.

ENGL 303: Introduction to Linguistics (3 credits)
Acquaints students with four main aspects of the study of language: phonetics and phonology, morphology, syntax, semantics, pragmatics. Considers how social practices shape and are shaped by language use (sociolinguistics), how children acquire language (first language acquisition), and how we learn second languages (second language acquisition/learning).

ENGL 304: Short Story (3 credits)
Introduces major short story writers in English to emphasize familiarity with the composition, technique, style and thought process of a short story by understanding the elements that make it different among other forms of fictional and non-fictional prose.

ENGL 305: Teaching English as a Second Language (3 credits)
Focuses on the theories of language acquisition, the relationship between first and second language acquisition, teaching methodologies, theoretical links between teaching and learning, an introduction to current theories (post-methodology) and the practical consideration of the profession and necessities of classroom work. Offers academic and practical preparation to students who intend to pursue a career as ESL teachers.

ENGL 307: Drama I (3 credits)
Introduces critical awareness of drama as a genre and a tradition with focus on its mutation from the Classical to Elizabethan age onwards. Readings include classical models that are followed to comprehend a play as a 'well-written' play.

ENGL 309: Modern Poetry (3 credits)
Starts with analysis of modernism and goes on to include its influence on literature ranging from early 20th century onwards.

ENGL 310: Romantic Poetry (3 credits)
Critical study and analysis of late romantic poetry from the 18th to early 20th century, dealing with various literary trends and poetic traditions.

ENGL 315: English Poetry I (3 credits)
Critical study and analysis of poetry from the Elizabethan to the pre-romantic age.

ENGL 320: American Poetry (3 credits)
Critical study and analysis of American poetry starting from 1500 till 20th century post-modern poets.

ENGL 321: American Novel (3 credits)
Explore the rise and development of the American novel. Students critically review different American novels and the concepts of the American dream, self dependency and self exploration. Authors studied include Nathaniel Hawthorne, Harriet Beecher Stowe, Earnest Hemingway, Toni Morrison and William Faulkner.

ENGL 325: American Drama (3 credits)
Different concepts, approaches, forms and techniques used in American Drama. Explores the socio-cultural context of selected texts, focusing on authors such as Arthur Miller, Eugene O' Neil, Tennessee Williams, Edward Albee and Sam Shepard. The selection of the playwrights polishes the students' ability to analyze and critically practice different types of texts in terms of their literary importance in history, representation and philosophical concerns.

ENGL 331: Research Methods for English Literature & Language (3 credits)
Prepares students for formal thesis writing. Focuses on the techniques of writing professional abstracts, developing a thesis statement and contention, finding appropriate topics for research papers, preparation and annotation of bibliographies, writing reviews from critical and analytical perspectives. A major objective is to help students prepare a proposal for their final thesis course (ENGL 499) which is a requirement for all literature majors.

ENGL 332: Film and Video: New Representative Forms of Literature (3 credits)
Prerequisite: It is assumed that students opting for this course already have some understanding of media forms, literature and literary criticism, and that they have studied ENGL 207

The comparative study of film, video and other changing modes of literary texts, such as documentary, drama, comedy film, art film and music videos.

ENGL 401: Modern Drama (3 credits)
Familiarizes students with the works of major modern dramatists; the emotional, social, cultural, economic and political context of their important works; and diversity in style, form and thought. Reviews the literary movements introduced by and influencing these dramatists. Plays taught are by G B Shaw, Henrick Ibsen, Anton Chekhov, Edward Bond, Bertolt Brecht, Samuel Beckett, Harold Pinter, August Strindberg, Garcia Marquez, Lorca.

ENGL 402: English Prose II (3 credits)
Familiarizes students with a variety of classical non-fictive prose works ranging from the post-Victorian era to modern times, such as modern essays, columns, letters, memoirs and speeches written by renowned writers from the postcolonial world.

ENGL 403: Contemporary Literary Criticism (3 credits)
With classical literary critical approaches serving as a backdrop, this course offers the latest trends in literary criticism and theory to trace influence and interaction of contemporary literary criticism within the diverse range of literary genres.

ENGL 404: English Poetry II (3 credits)
Focuses on post-World War II poetry from various poetic traditions and emphasizes texts by contemporary world poets.

ENGL 405: Drama II (3 credits)
Explores ways in which the genre of drama shifts beyond western concepts and to a greater extent applies the surrounding realities of our own context. Explores the contribution of this ever-expanding genre in terms of its theatricality, stagecraft and dramaturgy.

ENGL 407: Pakistani and Indian Literature in English (3 credits)
Introduces students to selective works by Indo-Pak writers writing in English. Explores general issues and literary criticism related to the questions of identity, boundary, separation, segregation, co-existence and expression. Generates interest for these literary works by recognizing them as a significant addition to the English literary studies.

ENGL 499: Thesis (3 credits)
Prerequisite: ENGL 331, ENGL 221 or ENGL 403
This mandatory course trains students for advanced academic writing and research. Students choose a topic of their interest approved by the supervisor and develop a thesis statement along with an abstract or proposal for literary, linguistic, critical or textual analysis. The statement is expanded into a longer essay of approximately 8,000 words with bibliographies and other academic formatting requirements.

19. Environmental Sciences

Introduction

Environmental Science is allied with the expression and consequences of human behavior on the physical state of the earth and also on biological life on the earth. Environmental issues are escalating. It is thus absolutely necessary that causes of concern be understood so that society can work together, through education, discussion and action, to solve problems and prevent escalation of damage to the earth. Discussion and action involves all of society at local, national and global levels.

The program is based on human knowledge, global environmental issues, challenges, and plans of action. Variations in understanding, needs, and action plans exist in different parts of the world depending upon local features and issues.

The Environmental Science program at FCC is not a department in itself, but rather a cross-disciplinary field, encompassing multiple scientific disciplines including physics, chemistry, earth geography, ecology and biology. It is coordinated by the Faculty of Natural Sciences.

BSc (Hons) Environmental Sciences

The BSc (Hons) Environmental Sciences degree aims to identify environmental problems and their causes. Worldwide issues will be studied with emphasis on environmental issues in Pakistan. Through energetic courses, descriptive field trips, and special programs, faculty and students will work to propose understandable and workable guidelines for conservation, restoration, and sustainability of the environment to meet local and national needs. Students can choose from two concentrations:

- Biological Sciences
- Physical Sciences

Learning Objectives

1. Describe major concepts in environmental sciences including theories, laws, and functional methodologies.
2. Think critically and use concepts in environmental science to solve problems.
3. Explicate the range of career possibilities in environmental science.
4. Utilize library resources and technology to gather information and solve problems.
5. Apply ethical principles.

Requirements for the Major

Statistics, Mathematics, Biology, Chemistry and Physics at Intermediate or A Level are prerequisites.
Students who have not studied Biology at Intermediate or A Level or equivalent must take BIOL 104.

Those who have not studied Math at Intermediate or A Level or equivalent must take MATH 101.
Those who have not studied Chemistry at Intermediate or A Level or equivalent must take CHEM 100.
Those who have not studied Physics at Intermediate or A Level or equivalent must take PHYS 100.
Those who have not studied Statistics at Intermediate or A Level or equivalent must take STAT 101 or 102.

Students should take a minimum of 29 core credit hours and a minimum of 19 elective credit hours in their chosen area of concentration. Students are advised to take additional elective courses to improve their competitiveness.

Students with a CGPA of 2.75 or above will be eligible for the research project. Students with a CGPA less than 2.75 (and students with CGPA 2.75 or above not taking research) will have to take two additional courses from electives of their specialization.

Core Courses: 29 credits of BIOL 202, BIOL 302, CHEM 160, PHYS 102/PHYS 103, BIOL 205, BIOL 303, GEOG 210, ENVR 301

Biological Sciences Concentration

CHEM 440
GEOG 240, GEOG 312, GEOG 314, GEOG 374, GEOG 474
ENVR 251, ENVR 303, ENVR 304, ENVR 305, ENVR 306, ENVR 402, ENVR 403, ENVR 404, ENVR 406, ENVR 413, ENVR 498, ENVR 499
PHYS 151

Biological Sciences Concentration

CHEM 311, CHEM 320, CHEM 330, CHEM 350, CHEM 440, CHEM 442
ENVR 251, ENVR 305, ENVR 498, ENVR 499
PHYS 151, PHYS 221, PHYS 255, PHYS 334, PHYS 342, PHYS 351, PHYS 451, PHYS 452
GEOG 240, GEOG 312, GEOG 314, GEOG 374

Course Descriptions

PHYS 102: General Physics II (4 credits)
Prerequisite: PHYS 100 or Intermediate or A Level Physics or equivalent
Electricity, magnetism, DC and AC current, modern physics, laboratory.

PHYS 103: Mechanics (4 credits)
Prerequisite: PHYS 100 or Intermediate or A Level Physics or equivalent
Study of physical phenomena in mathematical terms, statics and dynamics of particles and rigid bodies, oscillatory and rotary motion, gravitation and fluid mechanics, laboratory.

CHEM 160: Introduction to Organic and Biochemistry (3+1 credits)
Prerequisite: Intermediate or A Level Chemistry
Bonding and structure of organic compounds, study of hydrocarbons including additions to multiple bonds and substitution reactions of benzene, petroleum products, chemistry of food and its components including carbohydrates, proteins, lipids, nutrition and caloric intake.

BIOL 202: Diversity in Plants (4 credits)
Classification of organisms, survey of algae, fungi and various groups of plants with emphasis on evolutionary trends.

BIOL 205: Biostatistics (3 credits)
Introduction to statistics including mean, mode, median, standard error and standard deviation, probability and test of significance, correlation, analysis of variance, regression and experimental design.

GEOG 210: Earth's Physical Realms (3 credits)
Spatial and functional dynamics of major physical phenomena relating to the planet Earth – its evolution, interior state, atmosphere, lithosphere, hydrosphere and ecosphere, physical phenomena and related cycles and man-environment interactions.

ENVR 301: Introduction to Environmental Sciences (4 credits)
Prerequisite: Instructor's approval required
Biological and physical environmental problems focusing on geological hazards, water quality, water supply, solid waste, introduced and endangered species, preservation of wetland ecosystem, social and political approaches to environmental management.

BIOL 302: Animal Form and Function (4 credits)
Comparison of animals with one another, similarities and differences among the major phyla of animal kingdom, external and internal variations in organs and systems and adaptations that enable them to live successfully in their respective environments.

BIOL 303: General Ecology (3 credits)
Basic principles of Ecology such as interaction of organisms with their environment, species and population dynamics, community structure and human interactions with natural populations and ecosystems. Emphasis on local environment, flora and fauna.

ENVR 251: Living Green (3 credits)
Key environmental issues such as population explosion, air, water, food, sanitation and climate change etc., remedies at local and individual level such as sustainable health, sustainable home, sustainable work place and sustainable energy future.

ENVR 303: Environmental Analytical Techniques (3 credits)
Instrumental methods of chemical analysis in an overall context of sampling and

evaluating sources of pollution, Analysis of contaminants both qualitatively and quantitatively in air, water, soil or plant materials.

ENVR 304: Environment and Biodiversity of Pakistan (3 credits)
Ecological science relevant to sustaining populations, species, ecosystems and the global biosphere, genetic inbreeding, critical population size community structure and organization, maintenance of critical ecosystem function and global biogeochemistry, human-driven environmental change and health of the biosphere from the organism to the planet.

ENVR 305: Population Dynamics and Urbanization (4 credits)
Relationship of population, resources and sustainability, factors affecting human population size, population age structure, consequences of increase or decrease in population, population projections, population growth models and methods of controlling population, population growth in relation to resource utilization and sustainability, history and future trends of population in Pakistan integrated with the economic realities.

ENVR 306: Environmental Plant Anatomy (3 credits)
Environmental factors -- edaphic, biotic and climatic, and their effects upon the anatomy of the plant, significance of plant anatomy in ascertaining major path of adaptive radiation within defined groups of plant, the anatomical strategies and adaptive responses that enable plants to survive and function in different environmental conditions.

ENVR 402: Solid Waste Management (3 credits)
Sources, classification, generations, onsite handling and storage, collection, transfer recycling and disposal techniques of municipal solid waste (MSW), land filling, thermal conservation, compositing, concept of integrated solid waste management, existing practices and their hazards, economic evaluation of the systems, hospital waste management.

ENVR 403: Occupational Health and Safety (3 credits)
Principles of occupational health at work, values system for industrial workers, OHS systems in different industrial sectors, components of OHS plan related to different activities such as industry, municipality etc., industrial hygiene and safety, accident prevention and elimination, safety equipments, pollution due to petroleum industry.

ENVR 404: Air and Noise Pollution Control (3 credits)
Importance of air, sources of air pollution, air quality monitoring, air pollution effects, global air pollution problems, air pollution control, air quality standards, basic principles of sound, measurement of sound, room acoustics, sources of noise pollution and effects, noise rating systems, noise standards and noise instrumentations.

ENVR 406: Climate, Past, Present and Future (3 credits)
Climate-definition, early climates, factors controlling the climates, major climatic turnovers during Paleozoic, Mesozoic and Cenozoic eras, Pleistocene ice age, sub recent and recent climate, tropical, temperate and arctic climates, Palaeomagnetic calendar, role of climatic factors in shaping, generating and controlling evolutionary forces, major climatic upheavals in the subcontinent and their signatures in the out crops, future climatic trends.

ENVR 413: Environmental Toxicology (3 credits)
Introduction to the principles of environmental toxicology, toxicants, sources, chemistry, cycling, transport, impacts and fate in aquatic and terrestrial environments, effects on biogeochemical cycles and uptake by organisms, interaction of drugs, chemicals and pollutants with biological systems.

ENVR 498: Internship (6 credits)
Students with CGPA 2.75 or above will be eligible for internship
The student will have to work in a well-known industry or organization for a minimum of 6 weeks and will observe the timings as prescribed by the host organization. The Director Internships will act as a liaison officer between the department and the host organization. The student will have a supervisor from the department as well as from the host organization. At completion of the training, student will submit a written report to both the supervisors and the students' internship will be evaluated by a departmental committee.

ENVR 499: Project/Research (6 credits)
Students with a CGPA 2.75 or above will be eligible for this research project. Students with CGPA less than 2.75 will have to take two additional courses from electives of their concentration.

GEOG 240: Global Environmental Issues (3 credits)
Earth's ecosystems, major issues relating to the human use and misuse of environmental resources and possible courses of action for their conservation.

GEOG 314: Hydrosphere Resources (4 credits)
Prerequisite: GEOG 101 or GEOG 210
Origin, structure and shape of the ocean basins, composition, thermodynamics, circulation and oscillations of marine water, maritime resources and their use by humans, water resources on land, their origin, distribution, availability and quality, use and conservation as a resource for mankind.

GEOG 474: Geographical Information Science (4 credits)
Prerequisite: GEOG 371 or GEOG 374
Principles of geographical information science, functions of geographic information systems, relationship between GIS and remote sensing.

CHEM 311: Fundamental Analytical Chemistry (3+1 credits)

Open to Juniors and Seniors

Gravimetric and volumetric methods of analysis including buffers, complexometric titrations, redox titrations, non-aqueous titrations, Karl-Fischer titrations, UV/VIS spectroscopic analysis, IR Spectroscopy, treatment of measurement errors; usage and handling of standards, sampling, precision, accuracy, signal-to-noise ratio, limits of detection and quantitation, statistical evaluation of data; quality control and quality assurance.

CHEM 320: Industrial Chemistry (3+1 credits)

Open to Juniors and Seniors

Efficiency and yield, common chemical industries with special reference to Pakistan including cement, surfactants, paper and pulp, glass and ceramics, leather, metallurgies of important metals, liquid crystals and inorganic polymers. Environmental industrial impacts and industrial environmental management.

CHEM 330: Biochemistry (3+1 credits)

Prerequisite: CHEM 160 or equivalent

Detailed structure and physiological function of primary metabolites including carbohydrates, proteins, lipids and nucleic acids, nature and role of enzymes and coenzymes, metallo-proteins and enzymes, mechanism of enzyme action, kinetics and regulation of enzymes and their industrial applications.

CHEM 350: Coordination Chemistry (3+1 credits)

Prerequisite: CHEM 150 or CHEM 250

Historical background of coordination compounds, nomenclature and stability, geometry of complexes having coordination number 2 to 9, explanation of optical and magnetic properties of coordination compounds, Jahn-Teller effect, isomerism and stereochemistry, stabilities of coordination compounds, characterization and applications of coordination compounds, metal based drugs, metal carbonyls and nitrosyls, organic reagents used in inorganic analyses.

CHEM 440: Environmental Chemistry (3+1 credits)

Open to Juniors and Seniors

Introduction to environment, air pollution, water pollution, noise pollution, solid waste pollution and environment, ecotoxicology, hazardous waste and its management.

CHEM 442: Green Chemistry (3+1 credits)

Open to Juniors and Seniors

Green chemistry, principles, evaluating materials, feed stocks and starting materials, types of reactions in chemical transformation, evaluation of methods to design safer chemicals, green chemistry and future trends.

PHYS 151: Introduction to Sources of Energy and Environment (3 credits)

Not recommended for first semester Freshmen

Conventional energy resources, fossil fuels including petroleum, natural gas, coal and tar sands, the promise and problems of nuclear energy, alternative energy sources, wind, solar, biogas, tidal etc., energy conservation, environmental pollution and its global effects.

PHYS 221: Electricity and Magnetism (4 credits)
Prerequisite: PHYS 103
Electrostatics, magneto-statics, electric current, laws of magnetism, Maxwell's Equations, electromagnetic energy and electromagnetic wave equations, laboratory.

PHYS 255: Introduction to Meteorology (3 credits)
Prerequisite: PHYS 102 or PHYS 103
Study of the physical processes of condensation, precipitation, radiation and radiative transfer, solar radiation, atmospheric motion measuring properties of the atmosphere, ionosphere and magnetosphere, Earth's magnetic field and charge density movement in the atmosphere.

PHYS 334: Thermal Physics (3 credits)
Prerequisite: PHYS 221
A statistical approach to thermodynamics, thermal and chemical equilibrium, classical and expanding gas heat engines, plane transition and irreversible processes.

PHYS 342: Computational Physics (3 credits)
Prerequisite: PHYS 221
Introduction to numerical technology for solving physics problems and programming chaotic motion, nonlinear mechanics, particle trajectories, Monte Carlo simulation of phase transitions.

PHYS 351: Environmental Physics (3 credits)
Prerequisite: PHYS 221
Introduction to environmental physics, radiation, radiation balance, heat and mass transfer, micrometeorology of crops.

PHYS 451: Sources of Energy (3 credits)
Prerequisite: PHYS 222
Study of the different sources of energy, including thermal, hydroelectric, solar, nuclear and thermo nuclear.

PHYS 452: Atmospheric Physics (3 credits)
Prerequisite: PHYS 322
General description of the atmosphere, atmospheric thermodynamics, solar and terrestrial radiation, atmospheric aerosol and cloud microphysical processes, atmospheric electricity and dynamics.

20. Department of Geography

Introduction

The Department of Geography has the distinction of pioneering the subject in the sub-continent, with glorious traditions and history going back to 1924. Its mission is to groom students as contributing persons for humanity and as inspiring leaders in the nation-building process. It focuses on the student's intellectual ability to take on the difficult challenges of today and the future.

The department offers a both BA (Hons) and BSc (Hons) degrees in Geography and is part of the Faculty of Social Sciences.

BA/BSc (Hons) Geography

Learning Objectives

1. Analyze and synthesize in-depth knowledge of different concepts and processes of physical, human and regional geography.
2. Demonstrate competency in the use of fundamental geographic tools/techniques for data collection, display and analysis.
3. Organize themselves as productive individuals in the service of humanity and develop themselves to become inspiring leaders in the progress and uplift of the country.
4. Design an independent research project with competence to build a spatiotemporal profile of the phenomena under investigation that helps in achieving recommendations for development.
5. Employ knowledge and skills that help in an advanced study in the discipline or job placement.

Requirements for the Major

BA (Hons) Major: A minimum of 36 credits are required to complete the degree. The course work includes (core): GEOG 210, GEOG 220, GEOG 274, GEOG 301, GEOG 311, GEOG 313, GEOG 471 and a directed project (GEOG 499) for 6 credits, minimum 3 electives in the upper division from Human Geography and Geographical Techniques and Methods.

BSc (Hons) Major: A minimum of 48 credits are required to complete the degree. The course work includes (core): GEOG 210, GEOG 220, GEOG 274, GEOG 301, GEOG 311, GEOG 313, GEOG 471 and a directed project (GEOG 499) for 6 credits, minimum 7 electives in the upper division from Physical Geography and Geographical Techniques and Methods.

Requirements for the Minor

Course work of 18-24 credits courses including (core): GEOG 210, GEOG 220 and GEOG 270, a minimum of two electives in upper division courses.

Free Electives: Any open course in lower or upper division. Option for the upper division course(s) may be considered by the Chairperson on recommendation by the instructor.

Students are expected to maintain a CGPA of 2.00 to earn a standing in Geography with at least 18 credit hours of upper division courses from FCC for BA (Hons) major; for BSc (Hons) major the requirement is a GPA of 2.0 and 24 credit hours in upper division courses at FCC. Mere pass/fail course grades will not be counted. For Geography minor, a minimum of 2.00 CGPA in the 18-24 credits must be earned.

Course Descriptions

General

GEOG 101: Fundamentals of Geography (3 credits)
Geography as a discipline, its thematic domains and fundamental concepts.

GEOG 301: Workshop on Geographical Thought and Concepts (2 credits)
Current philosophical themes in Geography, as well as the systematic doctrines and concepts that overwhelm the main streams of the discipline, implications of the current strides on the cognitive domains and their impact on the future course of geographical avenues.

Physical Geography

GEOG 210: Earth's Physical Realms (3 credits)
Spatial and functional dynamics of major physical phenomena relating to the planet Earth – its evolution, interior state, atmosphere, lithosphere, hydrosphere and ecosphere, physical phenomena and related cycles and man-environment interactions.

GEOG 240: Global Environmental Issues (3 credits)
Earth's ecosystems, major issues relating to the human use and misuse of environmental resources and possible courses of action for their conservation.

GEOG 311: Principles of Atmospheric and Hydrospheric Dynamics (3 credits)
Prerequisite: GEOG 101 or GEOG 210
Elements and forces generating weather phenomena, their dynamics and impact, climatic system and their classification, features and dynamics of marine masses, water resources on land.

GEOG 312: Meteorology and Climatology (3 credits)
Prerequisite: GEOG 210 or GEOG 311
Elements and forces producing lower atmosphere phenomena, the dynamics of heat flows, air movements, pressure changes, mass density, volume relationships and vaporization, release of moisture as applied to the changing state of the atmosphere and production of disturbances and storms, evolution of climatic systems, their spatial and temporal transformations and impact.

GEOG 313: Geodynamics and Geomorphology (3 credits)
Prerequisite: GEOG 101 or GEOG 210
Geostructuring, isostatic balancing, geotectonics and modulation, processes, agencies and cycles of landscape sculpturing and evolution including their temporal and spatial variations.

GEOG 314: Hydrosphere Resources (4 credits)
Prerequisite: GEOG 101 or GEOG 210
Origin, structure and shape of the ocean basins, composition, thermodynamics, circulation and oscillations of marine water, maritime resources and their use by humans, water resources on land, their origin, distribution, availability and quality, use and conservation as a resource for mankind.

GEOG 351: Physical Geography Seminar (2 credits)
Prerequisite: GEOG 210
Comprises of the departmental seminar investigating a selected field of physical geography. (Topic announced by the Chairperson, prior to registration.)

GEOG 411: Sustainable Management of Natural Resources (3 credits)
Prerequisite: GEOG 240 or instructor permission
Parameters and principles governing sustainability of the Earth's resources, international and regional efforts to achieve sustainability.

GEOG 416: Natural Hazards and Management Issues (3 credits)
Prerequisite: GEOG 240 or instructor permission
Natural phenomena causing hazards, related issues and problems, means and techniques of ascertaining their distribution, impact on human life and possibilities of recurrences, options for disaster preparation and loss mitigation.

Human Geography

GEOG 220: Human Domains of Geography (3 credits)
Spatial and systematic organization of economic, cultural, political, demographic and occupancy milieu, arising out of human use of the earth's environment, importance of human attitudes and values in resource use and shaping of the patterns.

GEOG 221: Geography of Tourism (3 credits)
Physical and cultural factors affecting the location and relative importance of recreational areas and tourist attractions, spatial analysis of tourist flows, modes of transportation, effects on regional economies and impacts on environment.

GEOG 222: Globalization-An Introduction (3 credits)
Evolution and dynamics of globalization and its impact on spatiotemporal patterns of human culture.

GEOG 322: Economic Geography (3 credits)
Principles governing multivariate interactions underlying the evolution and distribution of various economic activities and functions, the role of temporal and spatial variables responsible for changes in the economic systems and regions.

GEOG 323: Population Geography (3 credits)
Deals with spatial, temporal and structural aspects of population characteristics including growth, distribution, density, composition and migration, the relationship of demographic variables to cultural, economic and environmental factors.

GEOG 324: Settlement Patterns and Processes (3 credits)
Human settlement patterns: location, evolution, size, spacing, shapes and functional systems produced by interactive multivariate processes, forms and structures, problems relating to growth, congestion and evolution of ghettos.

GEOG 325: Political Geography (3 credits)
Comparative study of global political regions and related systems, varied approaches are explored such as power analysis, genetic analysis, functional analysis, thematic analysis and ethnic analysis of political units.

GEOG 326: Urban Environmental Issues (3 credits)
Dynamics of urban environment degradation and rectification mechanisms and policies, current environmental issues of urban centers in Pakistan.

GEOG 421: Cultural Geography (3 credits)
Prerequisite: GEOG 220 or instructor permission
Patterns and processes of the world cultural realms such as language, religion, social traits and ethnicity serving as foci for an in-depth understanding of the world and its people and cross-cultural interactions.

GEOG 422: Spatial Planning for Economic Development (3 credits)
Prerequisite: GEOG 322 or instructor permission
Theories of location and systematic modeling in describing nodes and hierarchy of economic clusters in terms of multivariate functional analysis and synthesis examined at evolving developmental modes.

GEOG 426: Spatio-Temporal Dynamics of Global Power Politics (3 credits)
Prerequisite: GEOG 325 or instructor permission
Global power-politics patterns through times, their dynamics, evolution, exigencies, impact and fate.

Regional Geography

GEOG 133: Geographical Profile of Pakistan (3 credits)
Features of physical environment, resources, culture, communications and trade of Pakistan, problems confronted by Pakistan relating to cross cultural relationships, socio-economic viability, environmental conservation, resource sustainability and development.

GEOG 232: World Regional Geography (3 credits)
Location, spatial distribution and interaction of human activities and resource patterns in a global context.

GEOG 233: Geography of South Asia (3 credits)
South Asia's physiography, climate, settlement, population, historical geography, economic activities and cultural landscape, geographical patterns, processes, issues and problems of the region.

Geographical Techniques & Methods

GEOG 270: Maps and their Interpretation (3 credits)
Different types of maps and their applications.

GEOG 274: Fundamentals of Cartography and Field Surveying (3 credits)
Map making, their use and contemplation techniques, collection and processing of field data, training in field surveying for map making.

GEOG 371: Digital Cartography (3 credits)
Prerequisite: GEOG 270 or GEOG 274; knowledge of computer software applications is preferred
Skill development in computerized map making and interpretation/analysis.

GEOG 374: Aerial and Satellite Imaging (3 credits)
Prerequisite: Knowledge of computer software applications; GEOG 272 or instructor permission
Elements and interpretation processes pertaining to aerial photographs, remote sensing of earth resources and occupancy patterns, global positioning system (GPS), geographic information science and systems (GIS), digital image processing (DIP).

GEOG 471: Qualitative and Quantitative Techniques in Geography (4 credits)
Prerequisite: Basic knowledge of computer software applications or instructor permission
Qualitative methodologies and quantitative techniques used by geographers in

analysis and synthesis of systematic spatial phenomena, application of statistical methods and thematic models for geographical analysis including the use of computer software and hands-on experience.

GEOG 474: Geographical Information Science (4 credits)
Prerequisite: GEOG 371 or GEOG 374
Principles of geographical information science, functions of geographic information systems, relationship between GIS and remote sensing.

GEOG 499: Directed Project (A & B) (3+3 credits)
Prerequisite: Knowledge of computer software applications or instructor permission
A session on orientation/hands-on training in techniques of project planning, designing, operational management, report preparation and presentation after the Junior year. It is followed by independent/participative research in the field, laboratory, or library under the direction of a member of the Geography faculty (appointed by the Chairperson) and preparation and presentation of research report/thesis.

21. Department of Health and Physical Education

Introduction

The Health and Physical Department at FCC provides a range of sports activities to students for the total development of their personality. It focuses on the following areas, which contribute and are indispensable for growth and strength of sports in the university.

- Sports culture
- FCC Sports Association activities and administration
- Coaching
- Officiating
- Competition opportunities and organization
- Facilities and equipment
- Scientific and medical support

FCC has a very comprehensive sports program. Its sports facilities include an 8-lane standard 400 m grassy track and a short course; 25 m swimming pool, five tennis courts and playing fields for cricket, football, hockey and handball. The Lucas Center has a well-equipped gymnasium, table tennis hall, basketball and badminton courts and offices for sports faculty and staff.

Intramural competitions in the above mentioned sports take place all year round. Deserving sportsmen are awarded Medals of Distinction, College Colors and Certificates of Merit.

Learning Objectives

1. Demonstrate during play the rules and regulations by which various games/ sports are played.
2. Demonstrate skills in sports and athletics.
3. Apply the techniques and skills needed to pursue positions in both school-based and commercial settings.
4. Demonstrate ethical sportsmanship while competing in individual and team sports.

Course Descriptions

Entry into any course requires students to pass a physical fitness test.

HPED 101: Cricket (1 credit)
Only for male students
Techniques of running, batting, bowling and fielding, working together both in offence or defense.

HPED 102: Football (1 credit)
For both male and female students
Techniques of running, passing, kicking, tackling, blocking, heading and dribbling, coordination for offensive and defensive teamwork.

HPED 103: Hockey (1 credit)
Only for male students
Technique of passing, dribbling, dodging, pushing with agility, speed and endurance.

HPED 104 (i): Swimming (1 credit)
For both male and female students
Basics of freestyle swimming.

HPED 104 (ii): Swimming (1 credit)
For both male and female students
Basics of the backstroke in swimming.

HPED 104 (iii): Swimming (1 credit)
For both male and female students
Basics of the breaststroke in swimming.

HPED 105: Volleyball (1 credit)
For both male and female students
Techniques for passing, blocking and smashing.

HPED 106: Physical Exercises (1 credit)
For both male and female students
General physical exercises, benefits of physical activities.

HPED 107 (i): Athletics (1 credit)
For both male and female students
Techniques for sprints and javelin throw

HPED 107 (ii): Athletics (1 credit)
For both male and female students
Techniques for discus throw and relay races, physical fitness.

HPED 108: Table Tennis (1 credit)
For both male and female students
Techniques to play table tennis for recreation or competition.

HPED 109: Badminton (1 credit)
For both male and female students
Techniques to play badminton for recreation or competition.

HPED 110: Basketball (1 credit)
For both male and female students
Skills of ball holding, dribbling, passing and shooting.

HPED 111: Tennis (1 credit)
Only for male students
Fundamental skills of playing tennis for recreation or competition.

HPED 112: Handball (1 credit)
For both male and female students
Skills and knowledge of the game: ball holding, handling, dribbling, passing and shooting.

22. Department of History

Introduction

The Department of History is one of the oldest departments in Forman Christian College. It has many luminaries associated with it such as Professor Griswold, Professor Brush and Dr Z H Zaidi. The department aims to develop in the students analytical, critical, scientific, argumentative and methodical thinking skills for assessing past occurrences in order to draw conclusions which help to broaden their mental horizons, enrich their vision and enhance their knowledge. The department is part of the Faculty of Social Sciences.

BA (Hons) History

The Department of History is one of the oldest departments in Forman Christian College. It has many luminaries associated with it such as Professor Griswold, Professor Brush and Dr Z H Zaidi. The department aims to develop in the students analytical, critical, scientific, argumentative and methodical thinking skills for assessing past occurrences in order to draw conclusions which help to broaden their mental horizons, enrich their vision and enhance their knowledge.

Learning Objectives

1. Demonstrate mastery of historical concepts and theories and apply them to historical facts in the context of their times and subsequent historical events.
2. Demonstrate an understanding of the history and current situation of Pakistan in the context of South Asian and world history.
3. Demonstrate skills in research methodology in history.
4. Demonstrate a critical approach to primary and secondary sources.
5. Present ideas and research efforts in a scholarly and clear manner in English, both orally and in writing.
6. Integrate a broad understanding of civilizations and cultures throughout the world and apply knowledge to current and future events.
7. Show appreciation for the importance of historical events to ordinary people.
8. Integrate and apply the knowledge of historical concepts, theories, facts and trends into other academic subjects and in future scholarship and employment.

Requirements for Major

Core courses: HIST 201, HIST 301, HIST 303, HIST 401, HIST 405 and 6 credits of Research Project.

Requirements for Minor

Core courses: HIST 101, HIST 250, HIST 302, HIST 304/HIST 305, HIST 306/ HIST 309, HIST 308/ HIST 402

Course Descriptions

HIST 101: Survey of South Asia (3 credits)
History of South Asia from the Indus Valley Civilization to the modern day, with a focus on historical periods and themes.

HIST 102: Survey of Western Civilization (3 credits)
Western Civilization from Ancient Greece and Rome to the French Revolution in 1789, themes which have shaped Western Civilization, including an understanding of the scholarly debate on the issues.

PKST 101: Pakistan Studies (3 credits)
The idea of Pakistan: history, geography, economy, politics, and society of Pakistan through an identification of major themes, personalities, and events which have affected and continue to have an impact on the development of the country.

HIST 201: Research Methodology (3 credits)
Dynamics of writing history, survey of the debate on historiography, conceptualisation, design and execution of research in history.

HIST 250: History of Salateen-e-Delhi (3 credits)
Prerequisite: HIST 101
The Delhi Sultanate period, its origins, main features and causes of its decline, development of art, culture and architecture of the age, and the evolution of state and society under the rule of the Sultans.

HIST 255: The Indus Valley Civilization (3 credits)
Prerequisite: HIST 101
Inception of Indus Valley Civilization, its life and eventual decline by utilizing current and early research, and debate on the subject as well as visits to relevant sites.

HIST 301: Philosophy of History (3 credits)
Ideas behind the study of history, the different schools of thought in history and the underlying theories with special attention to the development of South Asian and Muslim philosophy of history.

HIST 302: Survey of Modern Europe (3 credits)
Prerequisite: HIST 102
Europe and the French Revolution the unification of Italy and Germany, the high noon of imperialism, the Russian Revolution, the two world wars and the Cold War and key personalities.

HIST 303: Modern International Relations since 1914 (3 credits)
Prerequisite: HIST 102 or PLSC 101.

International system from the start of the First World War, key concepts in international relations, theory and practice, in-depth analysis of the relations between the big powers till the end of the Cold War.

HIST 304: History of the United States (3 credits)
Prerequisite: HIST 102
United States and the American Revolution: the early development of the nation, the civil war, reconstruction, westward expansion, international relations, participation the world wars, and the emergence of the US as the world's super power.

HIST 305: Ancient History of the Subcontinent (3 credits)
Prerequisite: HIST 101
Ancient history of South Asia, advent of Aryans, conquests, politics, society and religion of the Indus Valley Civilization, the Epic Age, Caste system, the rise of Buddhism, Alexander's invasion, the Maurayas, the Guptas, and the development of Indian art and culture during the period.

HIST 306: Islamic History: The Umayyad and Abbasid Period (3 credits)
Ummayad and Abassid periods, their central and provincial administrations, expansion and conquests, religious policy, fiscal policy, foreign relations, the development of art and culture, and the causes of their downfall.

HIST 308: History of Lahore (3 credits)
Prerequisite: HIST 101
History of Lahore from its origin to the present day, its importance in different ages, its contribution to the development of art, architecture and culture, and its urban and rural dimensions.

HIST 309: Islamic History (3 credits)
Arabia before Islam, the socio-political and economic condition of the Arabs, the rise of Islam, the life of Prophet Muhammad (PBUH), the establishment of an Islamic state, and the early Caliphate.

HIST 310: Study of Institutions and Issues in Pakistan's History (3 credits)
Prerequisite: HIST 101
Bureaucracy, army, judiciary, parliament, Kashmir issue, provincial autonomy, East Pakistan debacle, ethnicity and human rights.

HIST 315: Freedom and the Nationalist Movement in the Subcontinent (1857-1947) (3 credits)
Prerequisites: HIST 101, HIST 201
Start of the nationalist movement in South Asia with a focus on the key events and personalities which shaped the society, politics and economy of the region during the period, the rise of Muslim separatism and the creation of Pakistan.

HIST 402: Mughal Rule in India (1526-1857) (3 credits)
Prerequisites: HIST 101, HIST 201, HIST 250
Condition of India before the Mughals, the rule of the great Mughals, their social, economic, religious and political policies, the development of art and culture during the period, the reasons for the fall of the empire and the rise of regional kingdoms.

HIST 403: British Rule in India (1757-1947) (3 credits)
Prerequisites: HIST 101, HIST 201
The role and impact of the British in India, political rise of the East India Company in 1757, the expansion of British influence through treaties and conquests, the Revolt of 1857 and the coming of the Raj, its policies, and its effect on the society, politics, economy and religious life of India.

HIST 405: Modern Muslim World (1945-2008) (3 credits)
Prerequisites: HIST 101, HIST 201, HIST 306
Post Second World War history of the Middle East with emphasis on the rise of Arab nationalism, Muslim solidarity, Israeli-Palestinian issue, the creation of modern states, and developments in state, society, religion and economy.

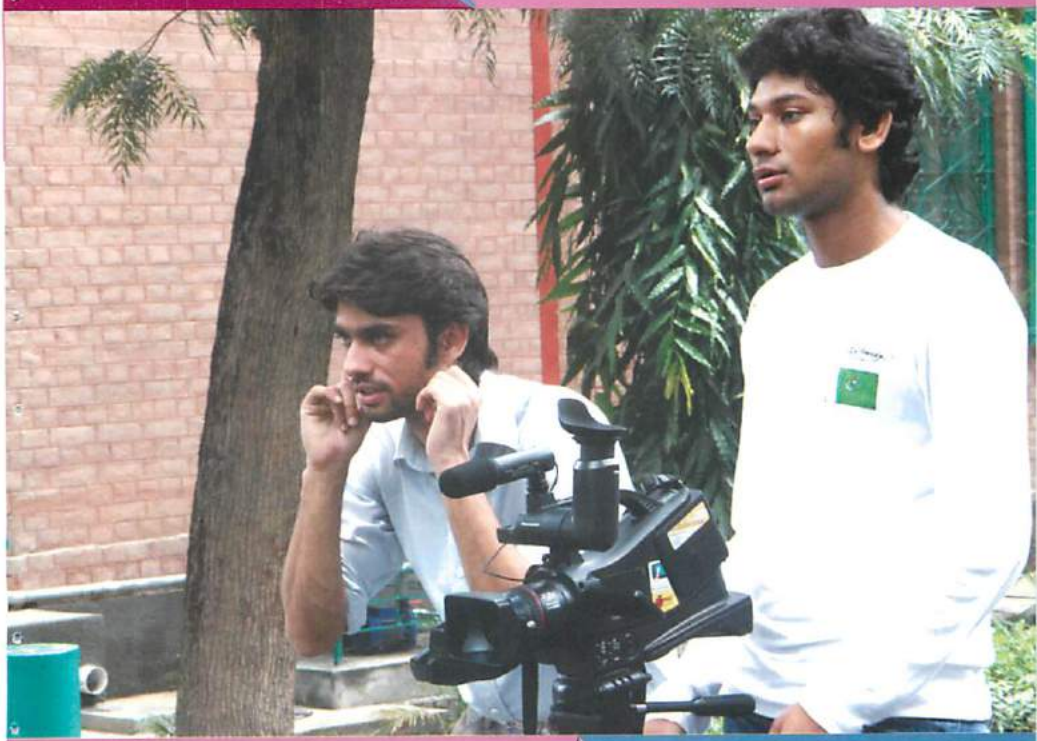
HIST 407: Renaissance and Reformation (3 credits)
Prerequisite: HIST 102
Europe from the advent of the Protestant Reformation, its Catholic reaction, religious wars, the rise of the nation state, the Enlightenment period, renaissance in art, science, literature and culture during the period, till the French Revolution.

HIST 410: Colonial Punjab, 1848-1947 (3 credits)
Prerequisites: HIST 101, HIST 403
Punjab's history during Colonial rule, geography of Punjab in historical perspective, the support of local elites for colonial rule, the growth of the agrarian economy, and the political, social, and economic effects of these issues on the province.

HIST 490: Senior Seminar in History
Prerequisites: PKST 101; HIST 101 or 102; HIST 201
This seminar course comprises of extensive readings on a selected topic (varying each semester) under the leadership of a faculty member who will facilitate in-depth analysis and discussion. The course will prepare students for independent research through a series of short papers and a final term paper on the course topic.

HIST 499: Independent Research
Prerequisite: HIST 490
In this course the student will articulate a question to be investigated, draw up a plan of research, glean information from primary and secondary sources, analyze the material, and present an argument and conclusions in a 10,000 word paper. The paper should integrate the methods learned in prior classes about historical analysis with what has been learned through the research. Students will conduct the research under the guidance of a member of the History faculty or any other person acceptable to the Chairperson of the department.

23. Department of Mass Communication



Introduction

The Department of Mass Communication was established in 2003. It aims to equip its students with all the tools that are required to secure a job or pursue higher research degrees. This is made possible by a dedicated faculty as well as links with the media industry.

Particular attention is paid to the topics of research offered by the department to ensure that novice researchers learn and properly implement research methodologies suiting their projects. Students get individual attention of research supervisors at every stage of their research. The department offers a BA (Hons) degree and is part of the Faculty of Humanities.

BA (Hons) Mass Communication

The BA (Hons) program is designed keeping in view the practices and growth of Mass Communication in Pakistan. All the aspects of media working are covered, ranging from writing and reporting news to political, cultural, legal and sociological aspects of Mass Communication. The program offers fundamental knowledge about new technologies in broadcasting, telecommunications and print. Leading industry professionals from television, radio, public relations and advertising are invited for special lectures from time to time. This helps students get up-to-date knowledge of the industry in addition to bolstering the prospects of future contacts and placements/internships in the media.

Learning Objectives

1. Explain the nature and working of print and electronic media.
2. Demonstrate skills for employment in advertising, public relations, print and electronic media.
3. Describe important mass communication roles of media managers, administrators and researchers.
4. Analyze principles and strategies of communication.
5. Analyze areas of media's effect on individuals and society.
6. Evaluate media laws and ethics.

Requirements for the Major

Minimum of 36 credit hours including core courses MCOM 201, MCOM 301, MCOM 310, MCOM 407/ MCOM 499.

Other recommended courses: ECON 100, PLSC 320, URDU 207, URDU 208, SOCL 100, CSIT 210,ENGL 332, ENGL 207.

Requirements for the Minor

Minimum of 21 credit hours including MCOM 101, MCOM 103, MCOM 201, MCOM 301 and MCOM 310.

Course Descriptions

MCOM 100: Fundamentals of Speech (3 credits)
Basic principles and practices of good vocal production and oral communication, texts, verse and prose in terms of vocal delivery, basic components of communication through analysis and practice in a variety of oral presentations, English speaking skills.

MCOM 101: Introduction to Journalism (3 credits)
Introduction to print electronic and online journalism, types of journalism, news organization, basics of reporting and editing, contents of newspaper, television and radio.

MCOM 103: Introduction of PR & Advertising (3 credits)
Advertising and its role in the society, consumer culture, advertising and mass media marketing, public relations, selling and sales management, processes and tools of PR.

MCOM 201: News Reporting (3 credits)
Prerequisite: MCOM 101
Mechanics, elements, value and structure of stories for print and electronic media, news sources for print and electronic media, qualifications and functions of a reporter, basics of camera and microphone reporting, interpretative and investigative reporting, reporting beats and interview techniques.

MCOM 202: Sub-Editing (3 credits)
Prerequisite: MCOM 101
Introduction, importance and process of sub-editing, functions and qualifications of a sub-editor, source of news, techniques, types and new trends in headlines, technique, types and new trends in make-up, monitoring importance and techniques of radio and television, importance and techniques of picture editing and caption writing for pictorial display, journalistic terminologies.

MCOM 203: Media & Peace Building (3 credits)
Prerequisite: MCOM 101
Introduction to peace building, introduction to interactive communication approach, tools of Mass Communication, understanding conflict, tools for conflict analysis, introduction to theater, role of music in peace building process, art for peace, vision and framework for peace and justice, the universal declaration of human rights, universal Islamic declaration of human rights, latest human rights report (topics related to women, minorities, democratic governance).

MCOM 301: Press Laws and Ethics (3 credits)
Prerequisite: MCOM 201
Evolution of press laws with special reference to the sub-continent and Pakistan, critical analysis of the current press and publication regulations, PEMRA laws pertaining to the electronic media in Pakistan, freedom of expression, defamation laws, contempt of court, contemporary trends in copyright law and the concept of intellectual property rights, code of ethics for journalists from Western and Islamic perspectives.

MCOM 302: Opinion Writing (3 credits)
Prerequisite: MCOM 201
Contents and importance of editorial page, definitions and functions of editorial writing, qualification of editorial writers, topic selection, sources of material, types and structure of editorials, importance and selection of letters to the editor, definitions, structure types and importance of column and feature.

MCOM 303: Public Relations (3 credits)
Prerequisite: MCOM 103
Definition and purpose, tools of public relations in Pakistan, duties of a PR organization, definition and basic ingredients of a press release, press note, handout, press communiqué and press conferences, structure and functions of DGPR.

MCOM 304: Principles of Advertising (3 credits)
Prerequisite: MCOM 103
Definition, scope, function, essentials and economic aspects of advertising, advertising in Pakistan, advertising as a tool of marketing, advertising research, introduction to prominent advertising agencies of the world, advertising campaigns and their evaluation.

MCOM 305: Magazine Journalism (3 credits)
Prerequisite: MCOM 201
Introduction, scope and types of magazines, prospects and challenges of magazine journalism in Pakistan, writing for magazines, personality sketches, interviews and social round-ups, make-up and layout of magazines.

MCOM 306: Research Methodology (3 credits)
Prerequisite: MCOM 301 and only for students majoring in Mass Communication
Understanding of research methodology, concept of research, kinds of research, elements of research design, technique to prepare a research proposal.

MCOM 309: Media History (3 credits)
Introduction to the beginnings of the press, growth of the Muslim press in the subcontinent, role of the press in the War of Independence in 1857, journalistic achievements of Sir Syed Ahmad Khan, Maulana Muhammad Ali Johar and Mualana Zafar Ali Khan, role of press in the Pakistan Movement.

MCOM 310: Mass Communication Studies (3 credits)

Prerequisite: MCOM 301

Definitions, types, elements and models of communication and mass communication, features and functions of mass communication, media literacy, public opinion and propaganda, two-step flow of communication, barriers in communication, essentials of effective communication, gate-keeping and information control, the role of the opinion leader, current media trends, mass media and culture, mass media and society, mass media effects debates.

MCOM 401: Radio Broadcasting: A Theoretical Introduction (3 credits)

Prerequisite: MCOM 301

Origin and development of radio in the subcontinent, functions of broadcasting house, role in national development, distinctive features of radio news, interviewing for radio, duties of a radio producer, trends in FM radio in public and private sector in Pakistan.

MCOM 402: Television: A Theoretical Introduction (3 credits)

Prerequisite: MCOM 301

Set-up and working of news, duties of a news producer, sources of TV news, TV news film, basics of news film shooting and editing, drafting of TV news, compilation of bulletins, preparation of network bulletins, students will submit 5 news reports and two interviews of ten minutes duration each on CDs/DVDs.

MCOM 404: Community Journalism (3 credits)

Prerequisite: MCOM 201

Status and issues regarding women, children, minorities and human rights in the local community with special emphasis on Pakistan, media coverage, NGOs and mass awareness campaigns in Pakistan, role of mass media in reporting human rights events.

MCOM 407: Internship (3 credits)

Prerequisite for Internship: CGPA 2.75

An internship will allow students to experience first-hand functioning of the media organizations, sub-editing techniques, reporting techniques of different beats such as parliament, sports, commerce, social services and courts, etc.

MCOM 409: Theories of Mass Communication (3 credits)

Prerequisite: MCOM 310

Theories and models of mass communication.

MCOM 410: Documentary Making (3 credits)

Prerequisite: MCOM 402

Scripting, cinematography, editing, narration, students will make two documentaries of 5-10 minutes each on DVDs/CDs.

MCOM 412: International Communication (3 credits)

Prerequisite: MCOM 310

International communication, free flow of information (NWICO), intercultural communication, global media giants, global media and cultural dependency, role of media in conflict resolution, media and foreign policy, issues in international communication, advocative, adversarial and watchdog role of international media, trans-border data flow.

MCOM 413: Media, Society & Culture (3 credits)

Prerequisite: MCOM 409

The relationship between media, society and culture, theories of media and culture, theories of media and society, cultural socialization, homogenization, acculturation, cultural diversity, pluralism, relativism and mass media, social change and mass media.

MCOM 499: Research Thesis/Project (3 credits)

Only for students majoring in Mass Communication

Prerequisite: MCOM 306

Students are required to submit one research thesis/project on any assigned topic at the end of the 8th semester.

24. Department of Mathematics

Introduction

The Department of Mathematics offers a dynamic and supportive environment for both staff and students. It is acknowledged for its teaching and also for its student support. It offers an extensive range of undergraduate courses according to international standards. The department offers a BSc (Hons) degree in Mathematics and belongs to the Faculty of Information Technology and Mathematics.

BSc (Hons) Mathematics

The 4-year degree program in Mathematics was launched in 2005. Students majoring in Mathematics take 48 credit hours in their major as well as 47 or 48 in general education and 35 or 34 respectively as free electives. Students majoring in Mathematics take courses as free electives from the Mathematics Department or cross-listed courses with the other departments.

A degree in Mathematics develops clear logical thinking. The coursework looks at topics in Mathematics from pure Mathematics to how Mathematics is used in the real world. Cross-listing of courses with other departments further helps students to analyze Mathematics as a real world tool. Students obtain a secure understanding of Mathematics with a good choice of topics in pure and applied Mathematics at an advanced level.

Learning Objectives

- Demonstrate skills in numerical and symbolic manipulation.
- Use logical and quantitative thinking in problem solving.
- Apply mathematical knowledge to analyze and interpret information in other disciplines and professions.
- Identify Mathematics as a creative human endeavor.
- Show high standards of integrity, social responsibility, and respect for humanity in mathematical work.
- Prepare for higher studies and careers in mathematical sciences.

Requirements for the Major

A major consists of 48 credit hours which includes
Core Courses: MATH 201, MATH 202, MATH 203, MATH 209, MATH 301, MATH 302, MATH 307, MATH 309, MATH 310*, MATH 311, MATH 313, and 13 credit hours taken from
Elective Courses: MATH 106*, MATH 304, MATH 308, MATH 312, MATH 314*, MATH 315*, MATH 316*, MATH 401, MATH 402, MATH 403*, MATH 404, MATH 406, MATH 407, MATH 408*, MATH 409, MATH 410*.

Students should meet with the Chairperson of Mathematics or the undergraduate Advisor for a degree plan during the first year of study at FCC.

Important Notes

* indicates that the course is cross-listed with other departments. These courses have more than one designator (eg MATH/STAT) and code (105/102). Math majors will have the facility to take cross-listed courses in their own or another department and get them counted towards their Math major. However, a student can be registered in cross-listed courses with ONE CODE ONLY i.e., credit will be given only once with one code and not more than once with different codes.

MATH 105/STAT 102* will NOT be counted towards a Math major but as a Free Elective. However, it is a prerequisite for other courses which will be counted towards the Math major i.e., MATH 314/STAT 304*, MATH 315/STAT 311* and MATH 408/STAT 401*.

In addition, the following courses will be counted towards the Math major: MATH 106/COMP 113*, MATH 316/PHYS 341* and MATH 410/PHYS 461* but MATH 211/CHEM 220* will also be counted as a Free Elective.

Requirements for the Minor

A minor consists of 24 credit hours, which includes MATH 102, MATH 103, MATH 201, MATH 202, plus four courses from the list of elective courses above.

Course Descriptions

MATH 100: Quantitative Skills (3 credits)
Basic algebra and number theory, rounding, estimating and scientific notation, algebraic expressions, fractions, factoring, solving equations, two equations with two unknowns and their applications to daily life problems, quadratic equations and their applications, percentage problems (profit, loss, commission, zakat deduction, markup, margin, stock exchange index), ratio and proportion, work problems, distance problems (time, distance, speed, velocity), number sequence, basic geometry, mean, median, and mode, introduction to probability.

MATH 101: Pre-Calculus & Trigonometry (3 credits)
Fundamentals, solution of equations and inequalities, lines, functions, linear and quadratic functions, polynomial and rational functions, operations on functions, inverse functions, synthetic division, remainder and factor theorem, partial fractions, exponential, logarithmic and trigonometric functions, trigonometric identities, solution of right and oblique triangles.

MATH 102: Calculus I (3 credits)
Prerequisite: MATH 101 or A Level Mathematics or Intermediate with Mathematics
Functions, graph of functions, translation, stretching and compressing graphs; limit,

continuity and differentiability, differentiation and its basic rules, indeterminate forms, L'Hopital's rule, integration and its techniques, introduction to definite integral.

MATH 103: Introductory Linear Algebra (3 credits)
Prerequisite: MATH 101 or A Level Mathematics or Intermediate with Mathematics
Introduction to system of linear equations, matrices and matrix operations, elementary matrices, Gaussian elimination, Gauss Jordan method for solving a system of linear equation, determinants and their properties, vector spaces, subspaces, linear independence, basis and dimensions.

MATH 105/STAT 102*: Probability and Probability Distributions (3 credits)
Basic set theory, different approaches and laws of probability, conditional probability, Bayes' rule, random variables, some standard discrete and continuous probability distributions.

MATH 106/COMP 113*: Discrete Mathematics (3 credits)
Prerequisite: MATH 101 or A Level Mathematics or Intermediate with Mathematics
Introductory mathematical logic, methods of proofs (direct and indirect proofs), relations and functions, combinatorics, graphs and trees.

MATH 201: Calculus II (3 credits)
Prerequisite: MATH 102
Application of derivatives, extreme and mean value theorem, maxima, minima and inflection point of single variable functions, Taylor's theorem and approximation, application of integration, area and arc length, introduction to improper integrals, volume and surface of revolution, infinite series, power series, introduction to Conic section.

MATH 202: Ordinary Differential Equations (3 credits)
Prerequisite: MATH 102
Definitions and examples, formation of differential equations, solution of first order differential equations, solution of higher order differential equations, system of differential equations, Laplace transforms method, series solution of differential equations.

MATH 203: Vector Analysis (3 credits)
Prerequisite: MATH 102
Scalar and vector, product of two vectors, scalar and vector triple product, vector differentiation and its use in differential geometry and mechanics, gradient of a scalar field, divergence and curl of a vector field, vector integration (line integral, surface integral and volume integral), divergence and stokes theorem.

MATH 209: Linear Algebra (3 credits)
Prerequisites: MATH 102, MATH 103
Review of vector spaces, subspaces and basis, row space, column space, rank, nullity,

inner product spaces, orthogonal basis, Gram Schmidt process, orthogonal matrices, Eigenvalues and Eigenvectors, diagonalization, orthogonal diagonalization, positive definite and negative definite matrices, linear and inverse linear transformation, matrix of linear transformation and quadratic forms.

MATH 210: Set Theory (3 credits)

Prerequisite: MATH 101 or A Level Mathematics or Intermediate with Mathematics

Sets and basic operations on sets, relations, functions, cardinal and ordinal numbers, axioms of choice, Zorn's lemma, well-ordering theorem.

MATH 211/CHEM 220*: Mathematics for Chemists (3 credits)

Prerequisites: MATH 103, MATH 201

Spherical and polar coordinates, complex numbers, complex plane, functions of complex variable, analytic functions, residues and contour integration, Euler's Formula, higher order derivatives, partial derivatives, solving ordinary differential equations of first and second order and linear transformations.

MATH 301: Multivariable Calculus (3 credits)

Prerequisite: MATH 201

Vectors, analytic geometry in 3-space, quadratic surfaces, partial and directional derivatives, Chain rule, Euler's theorem, maxima and minima of function of more than one variable, Lagrange's multipliers, double and triple integral with applications, line integral and Green's theorem.

MATH 302: Mechanics (4 credits)

Prerequisite: MATH 203

Composition and resolution of forces, friction, kinematics and dynamics of a particle, Projectile Motion.

MATH 304: Operations Research (3 credits)

Prerequisite: MATH 103

Introduction to operations research, graphical solution, Simplex method, two phase method, M-method, sensitivity analysis, primal dual relationship, dual simplex method, transportation model, assignment models, transshipment models, network models, Dijakstra's algorithm, Floyd's algorithm, spanning tree algorithm, Maximal Flow algorithm.

MATH 307: Complex Analysis (4 credits)

Prerequisite: MATH 201

Complex numbers, polar form of complex number, limit, continuity and differentiability of function of a complex variable, analytic functions, C-R equations, transcendental functions, complex integration, Cauchy theorems, entire function, Liouville's theorem, Morera's theorem, Taylors and Laurent's series, Residue theory, Cauchy residue theorem, Contour integration, conformal mappings.

MATH 308: Differential Geometry (3 credits)
Prerequisite: MATH 301 or MATH 203
Moving trihedron (tangent, normal, binormal), osculating, normal and rectifying planes, curvature and torsion, Serret-Frenet equations, natural equations, evolute and involute, first and second fundamental forms of surfaces, tangent planes.

MATH 309: Real Analysis (3 credits)
Prerequisite: MATH 201
Sets and functions, the completeness property of R, intervals, sequences and their limits, convergent and divergent sequences, convergence of monotone sequences, limits of functions, continuous functions, uniformly continuous functions and differentiability.

MATH 310/CSCS 310*: Numerical Analysis (3 credits)
Prerequisite: MATH 102 or MATH 103
Solution of system of linear equations, solution of non linear equations, error analysis, interpolation by polynomials, Lagrangian interpolation, numerical differentiation, numerical integration, computer programming will be done by using any suitable software like MATLAB, MAPLE or MATHEMATICA.

MATH 311: Topology and Metric Spaces (3 credits)
Prerequisite: MATH 103
Metric spaces, discrete and pseudo metric spaces, open and closed sets, closure and interior of sets, convergence and Cauchy sequences, complete metric space, topological spaces, basis and sub-basis, open and closed function, continuity and homeomorphism, separation axioms, connectedness, compactness.

MATH 312: Integral Equations (3 credits)
Prerequisite: MATH 202
Introduction to integral equations, linear and non-linear integral equations, Volterra and Fredholm integral equations, conversion of ordinary differential equations to integral equations, integral equations with symmetric and separable kernels, method of successive approximation, integral transform method.

MATH 313: Group Theory (3 credits)
Prerequisite: MATH 103
Definition and examples of group, subgroups, cyclic groups, cosets, Lagrange's theorem, conjugacy, normal subgroups, quotient groups, homomorphism and isomorphism, Caley's theorem.

MATH 314/STAT 304*: Distribution Theory (3 credits)
*Prerequisite: MATH 105/STAT 102**
Random variables and expectations of their functions, theory and application of important discrete and continuous distributions.

MATH 315/STAT 311*: Mathematical Statistics (3 credits)
*Prerequisite: MATH 105/STAT 102**
Transformation of variables, t, Chi square and F distributions with properties, distribution of order statistics, non-central distributions.

MATH 316/PHYS 341*: Methods of Mathematical Physics (3 credits)
Prerequisite: MATH 102 or PHYS 103
Vector analysis and special function curvilinear coordinates, Legendere polynomials, Bessel functions, Neuman functions, Couchy-Riemna equations, Fourier series and Fourier transformations, tensor analysis.

MATH 401: Advanced Group Theory (4 credits)
Prerequisite: MATH 313
Direct product of groups, Sylow Theorems, series in groups, solvable groups, Nilpotent groups, free groups, free products of groups, linear groups.

MATH 402: Ring Theory (4 credits)
Prerequisite: MATH 313
Definition and examples of rings, subrings, special classes of rings, ideals, quotient rings, ring homomorphism, factorization in integral domain, fields.

MATH 403/CSCS 403*: Graph Theory (4 credits)
*Prerequisite: MATH 106/COMP 113**
Graphs, sub graphs, isomorphism, trees, connectivity, Eulerian and Hamiltonian graphs, matchings, Vertex and Edge Colorings, Planarity.

MATH 404: Partial Differential Equations (4 credits)
Prerequisite: MATH 202
Introduction to partial differential equations (PDEs), origins and solution of first-order partial differential equations, origins and solution of second-order partial differential equations, Canonical forms of second-order PDEs, solution of PDEs by method of separation of variables, Boundary Value Problems, solution of PDE's by integral transforms.

MATH 406: Integration Theory (3 credits)
Prerequisite: MATH 201
Riemann Integrals, conditions of integrability, integrability of continuous and discontinuous functions, mean value theorems of integral calculus, Riemann Stieltjes integrals, theorems related to Riemann Stieltjes integrals, improper integrals, introduction to Generalized Riemann integrals.

MATH 407: Functional Analysis (3 credits)
Prerequisite: MATH 311
Normed spaces, Banach spaces, convex spaces, equivalent norms, quotient spaces, linear operators, Hilbert spaces, decomposition theorem in Hilbert spaces, annihilators.

MATH 408/STAT 401*: Stochastic Processes (3 credits)

*Prerequisite: MATH 105/STAT 102**

Introduction, random walk and ruin problem, Markov chains and Markov processes, power spectra and linear systems, renewal theory, Brownian motion.

MATH 409: Continuum Mechanics (4 credits)

Prerequisite: MATH 203 and MATH 209

Algebra of vectors, transformation laws for basis vectors and components, algebra of Cartesian tensors, Eigenvalues and Eigenvectors of Cartesian tensors, configurations, and motions of continuum bodies, displacement, velocity, acceleration fields, gradients and related operators, material, spatial derivatives, deformation gradient, strain tensors, rotation, stretch tensors with applications like SIMPLE SHEAR deformation and balance laws.

MATH 410/PHYS 461*: Quantum Mechanics I (3 credits)

Prerequisite: MATH 302 or PHYS 301

Historical origination of the quantum theory, foundation of wave mechanics, Schrodinger wave equation and its solution for free particles, the hydrogen atom and the harmonic oscillator.

25. Department of Philosophy

Introduction

The vision and mission of FCC, to impart, create and disseminate knowledge, is best encapsulated in the oldest of disciplines: Philosophy. The wisdom of the sages is captured in the branches of Metaphysics and Epistemology; the application of this sagacity is developed by the branches of Logic and Ethics. The wide diversity of theories and applications is complemented by an in-depth study of specific thinkers from ancient, medieval, modern and contemporary periods. The study of Philosophy is thus the most significant guarantor of critical and creative thinking, and an indispensable requirement of today.

The Department of Philosophy at FCC is relatively new, but its rich tradition of learning and knowledge-seeking is adopted and adapted for contemporary times. It is part of the Faculty of Humanities.

BA (Hons) Philosophy

Learning Objectives

1. Know the major philosophical movements through the history of philosophy past to present.
2. Understand the various methods that have been used to identify and resolve philosophical problems.
3. Analyze philosophical arguments.
4. Apply critical thinking to whole life issues, that is, career, recreation, self-development, etc.

Requirements for the Major

A minimum of 36 credit hours, taken under advisement from the courses offered. 12 credits of basic courses, 18 credits of service courses and major electives, and the Senior capstone course along with an internship must be completed.

Requirements for the Minor

The minor in philosophy builds on the offerings taken from the major, accumulating to 18 credits: 4 prerequisite courses in addition to 2 courses of choice.

Prerequisite courses: PHIL 101, PHIL 201, PHIL 202, PHIL 221.

Course Descriptions

PHIL 101: Introduction to Philosophy (3 credits)
Selection of the problems historically identified as philosophical along with the

methods philosophers have used to solve these problems including justice and moral order, evaluation and justification of belief and human value and dignity, identifying the problems that have bothered critical thinkers, followed by selective philosophical solutions and their authors.

PHIL 201: Philosophy: Ancient through Medieval (3 credits)
Rise of critical thought in the pre-Socratic Greek world and its development through the issues related to deriving the morally right and individual significance by understanding the universe's structure and function, classic Platonic and Aristotelian worldviews, evaluation of their Eastern and Western historical critics through the end of the medieval period.

PHIL 202: Philosophy: Modern to Contemporary (3 credits)
Critical thought as it develops from the 16th century CE to the present, including Eastern as well as Western thinkers, issues that captured attention because of the rise of the sciences, the development of naturalism, humanism and the challenges of 20th century social crises.

PHIL 221: Logic: How to Think Clearly (3 credits)
Examination of logic, including both Stoic contributions as well as the systematic organization of the rules of right thinking developed by Aristotle and expanded by Medieval and later thinkers, concern about the issues raised by J S Mill and others who systematized inductive logic.

PHIL 231: Philosophy of Religion (3 credits)
Set of issues that has dominated modern and contemporary concerns about religious thought, problem of evil, meaningfulness of God talk, relevance of religion for moral and social justice etc.,

PHIL 322: Symbolic Logic (3 credits)
Logical formulation of the ideal language that is the basis of modern computer language, physics, and linguistics, natural deduction using quantification, sentential calculus.

PHIL 325: Philosophy of Education (3 credits)
Key issues relating to the conveying and acquisition of knowledge, examining their resolution by those theories which have been used to direct classroom practices, evaluating these approaches in terms of contemporary methods and challenges.

PHI 331: Theories of Ethics (3 credits)
Ethical issues of objectivity vs subjectivity in moral judgment, relativity vs universalizability of moral principles, the logical foundation of moral perspectives, the scope and limits of moral language etc. in light of contemporary theories designed to resolve them.

PHIL 332: Metaphysics (3 credits)
Worldviews built into language, perception molded by cultural structures, evaluation of tools necessary for explaining the regularities of human experience and worth.

PHIL 341: Epistemology (3 credits)
Critical analysis of the foundations of knowledge, classical theories, recent trends in substantiating belief and defining knowledge.

PHIL 342: Philosophy of Science (3 credits)
Rise of the scientific method from the perspective of the logic of scientific explanation, relevance of theory to experimental information, dependence of scientific explanation on a paradigm of how the world functions etc.

PHIL 401: Philosophical Investigations: The Ancient Period (3 credits)
PHIL 402: Philosophical Investigations: The Ancient Period (3 credits)
PHIL 403: Philosophical Investigations: The Ancient Period (3 credits)
The courses are rotated over a three-year sequence and allow the student to concentrate on careful study in the thought, context and impact of a specific ancient philosopher.

PHIL 411: Philosophical Investigations: The Medieval Period (3 credits)
PHIL 412: Philosophical Investigations: The Medieval Period (3 credits)
PHIL 413: Philosophical Investigations: The Medieval Period (3 credits)
The courses are rotated over a three-year sequence and allow the student to concentrate on careful study in the thought, context and impact of a specific medieval philosopher.

PHIL 421: Philosophical Investigations: The Modern and Contemporary Periods (3 credits)
PHIL 422: Philosophical Investigations: The Modern and Contemporary Periods (3 credits)
PHIL 423: Philosophical Investigations: The Modern and Contemporary Periods (3 credits)
The courses are rotated over a three-year sequence and allow the student to concentrate on careful study in the thought, context and impact of a specific modern or contemporary philosopher.

PHIL 499: Philosophical Research and Use Seminar (3 credits)
Senior Capstone Course plus an internship
Prerequisites: The core courses i.e. PHIL 101, PHIL 201, PHIL 202, and PHIL 221 and 18 credits of electives from the major.
Comprehensive study of the contemporary issues in philosophy involving the development of a major research paper with the provision of a community internship.

PHIL 303/PLSC 303 Contemporary Political Philosophy (3 credits)
Debates concerning the nature of political rights and duties, and the justification of political theories such as utilitarianism, Marxism, and democracy. Of special interest will be the classic documents influencing contemporary discussion, such as Jean-Jacques Rousseau's Discourse on Inequality, J S Mill's On Liberty, Che Guevara's Global Justice: Liberation and Socialism, Gandhi's All Men are Brothers, John Rawls's A Theory of Justice and Robert Nozick's Anarchy, Society and Utopia.

26. Department of Physics

BSc (Hons) Physics

Learning Objectives

1. Demonstrate a general working knowledge of the basic areas of physics and apply formal knowledge in a problem-solving environment.
2. Demonstrate proficiency in basic laboratory skills (e.g. instrumental analysis and laboratory safety) and formulate effective strategies for solving scientific problems.
3. Efficiently use library resources and technology to gather information, read, understand, and communicate scientific information clearly and precisely, both orally and in writing.
4. Analyze the broader implications of physics related experimentation and application processes (e.g., resource management, economic factors, and ecological considerations).
5. Work effectively with others as part of a team to solve scientific problems.
6. Describe the opportunities in, and requirements for, careers available to those with training in physics.

Requirements for the Major

A minimum of 48 credit hours including PHYS 103, PHYS 104, PHYS 221, PHYS 222, PHYS 301, PHYS 321, PHYS 322 and PHYS 461.

A minimum of 19 credits from the following courses as electives: PHYS 151, PHYS 255, PHYS 331, PHYS 332, PHYS 334, PHYS 341, PHYS 342, PHYS 351, PHYS 422, PHYS 451, PHYS 452, PHYS 462, PHYS 472, PHYS 481, PHYS 482, PHYS 483 and PHYS 498/499(*). Students are also recommended to take CHEM 117 and CHEM 118 and MATH 201, MATH 202 and MATH 203.

Requirements for the Minor

A minor in Physics is open to students of all disciplines with a minimum CGPA of 2.50.

A minimum of 24 credit hours including PHYS 103, PHYS 104, PHYS 221, PHYS 222.

A minimum of 9 credits from the following PHYS courses as electives: PHYS 255, PHYS 301, PHYS 321, PHYS 322, PHYS 331, PHYS 332, PHYS 334, PHYS 341, PHYS 342, PHYS 351, PHYS 422, PHYS 451, PHYS 452, PHYS 461, PHYS 462, PHYS 472, PHYS 481, PHYS 482 and PHYS 483.

Notes

The department offers these courses in accordance with available faculty and student

load. Students should consult their faculty Advisor or the department Chairperson as to availability in a particular semester or academic year.

All courses of 4 credit hours have laboratory instruction and practical associated with them.

Students desirous of pursuing higher educational Physics degrees in Pakistan should ensure that their combined aggregate credits in Physics, Chemistry and Mathematics, including courses in the General Education Science and Mathematics category, should exceed 70 credits.

The courses PHYS 341 (Mathematical Methods of Physics) and PHYS 461 (Quantum Mechanics) are cross-linked with the Mathematics Department and can be opted for in either department and counted for credits in each. Kindly see the Department of Mathematics pages for details.

Physics courses which appear in the Environmental Sciences section of the catalogue likewise count towards the fulfillment of degree requirements in both programs.

* Students not taking PHYS 498 or PHYS 499 due to eligibility or other reasons must take two additional Physics courses to complete the required credit hours for majoring/graduating.

Course Descriptions

PHYS 100: Introduction to Physics (4 credits)
Does not fulfill the General Education requirement for students who have studied Physics at Intermediate or A Levels or equivalent
Scope of physics, kinematics and bodies in motion, communication, basic electricity, medical physics and elements of astrophysics, laboratory: familiarization with measuring instruments and related experimentation.

PHYS 102: General Physics II (4 credits)
Prerequisite: PHYS 100 or Intermediate or A Level Physics or equivalent
Electricity, magnetism, DC and AC current, modern physics, laboratory.

PHYS 103: Mechanics (4 credits)
Prerequisite: PHYS 100 or Intermediate or A Level Physics or equivalent
Study of physical phenomena in mathematical terms, statics and dynamics of particles and rigid bodies, oscillatory and rotary motion, gravitation and fluid mechanics, laboratory.

PHYS 104: Wave and Vibrations (3 credits)
Prerequisite: PHYS 103 or Intermediate or A Level Physics or equivalent
Study of physical phenomena in mathematical terms, types of waves, mathematical representations, energy of waves, interference, diffraction and polarization.

PHYS 151: Introduction to Sources of Energy and Environment (3 credits)
Not recommended for first semester Freshmen
Conventional energy resources, fossil fuels including petroleum, natural gas, coal and tar sands, the promise and problems of nuclear energy, alternative energy sources, wind, solar, biogas, tidal etc., energy conservation, environmental pollution and its global effects.

PHYS 221: Electricity and Magnetism (4 credits)
Prerequisite: PHYS 103
Electrostatics, magneto-statics, electric current, laws of magnetism, Maxwell's equations, electromagnetic energy and electromagnetic wave equations, laboratory.

PHYS 222: Modern Physics (4 credits)
Prerequisite: PHYS 221 or PHYS 103
Study of Einstein's special theory of relativity, black body radiation, the Bohr atom, elementary wave mechanics, atomic and molecular spectra, exclusion principle, periodic table, X-ray spectroscopy, introduction to lasers, laboratory.

PHYS 255: Introduction to Meteorology (3 credits)
Prerequisite: PHYS 102 or PHYS 103
Study of the physical processes of condensation, precipitation, radiation and radiative transfer, solar radiation, atmospheric motion measuring properties of the atmosphere, ionosphere and magnetosphere, Earth's magnetic field and charge density movement in the atmosphere.

PHYS 301: Classical Mechanics (4 credits)
Prerequisite: PHYS 103 or MATH 302
Study of the motion of particles and system of particles, direct application of Newtonian mechanics, Langranian formulation, Hamiltonian formulation, motion under an inverse force field, two body problems, planetary orbital motion, Legendre transformation, canonical transformations and their properties, Poisson's brackets, theorems and invariance; laboratory.

PHYS 321: Electrodynamics (4 credits)
Prerequisite: PHYS 221
Emphasis on the unity of electric and magnetic phenomena, introduction of electrostatics and magneto-statics, solution of boundary-value problems, time-varying fields, gauge transformations, Maxwell's equations and wave equations, electromagnetic wave propagation in lossless, Lossy and metallic media, wave propagation through coaxial transmission lines, rectangular wave guides and radiation from oscillating dipoles, laboratory.

PHYS 322: Statistical Physics (3 credits)
Prerequisite: PHYS 222
Basic principles and concepts of statistical physics, behavior of large assemblies of

particles, phase space, physical systems, ensembles, classical and quantum mechanics, distribution functions, partition functions, thermodynamics functions and the principle of equi-partition energy.

PHYS 331: Electronics I (3 credits)
Prerequisite: PHYS 221
Study of the elementary physics of semiconductors, two-terminal devices, LEDs, lasers, Schottky diodes, three terminal devices and selected topics on metal contacts and device fabrication.

PHYS 332: Electronics II (4 credits)
Prerequisite: PHYS 331
Models for active devices, single-ended and differential amplifiers, current sources and active loads, operational amplifiers, feedback, design of analogue circuits for particular functions and specifications, design of decision-making circuits, memory type circuits and digital circuits, laboratory.

PHYS 334: Thermal Physics (3 credits)
Prerequisite: PHYS 221
A statistical approach to thermodynamics, thermal and chemical equilibrium, classical and expanding gas heat engines, plane transition and irreversible processes.

PHYS 341: Methods of Mathematical Physics (3 credits)
Prerequisite: PHYS 103 or MATH 102
Vector analysis and special function curvilinear coordinates, Legendere polynomials, Bessel functions, Neuman functions, Couchy-Riemna equations, Fourier series and Fourier transformations, Tensor analysis.

PHYS 342: Computational Physics (3 credits)
Prerequisite: PHYS 221
Introduction to numerical technology for solving physics problems and programming chaotic motion, nonlinear mechanics, particle trajectories, Monte Carlo simulation of phase transitions.

PHYS 351: Environmental Physics (3 credits)
Prerequisite: PHYS 221
Introduction to environmental physics, radiation, radiation balance, heat and mass transfer, micrometeorology of crops.

PHYS 422: Nuclear Physics (3 credits)
Prerequisite: PHYS 222
Nuclear forces, nuclear phenomenology, reaction and stability of nuclear models, radiation and decay, structure of the nucleus, particle phenomenology.

PHYS 451: Sources of Energy (3 credits)
Prerequisite: PHYS 222
Study of the different sources of energy, including thermal, hydroelectric, solar, nuclear and thermo nuclear.

PHYS 452: Atmospheric Physics (3 credits)
Prerequisite: PHYS 322
General description of the atmosphere, atmospheric thermodynamics, solar and terrestrial radiation, atmospheric aerosol and cloud microphysical processes, atmospheric electricity and dynamics.

PHYS 461: Quantum Mechanics I (3 credits)
Prerequisite: PHYS 301 or MATH 302
Historical origination of the quantum theory, foundation of wave mechanics, Schrodinger wave equation and its solution for free particles, the hydrogen atom and the harmonic oscillator.

PHYS 462: Quantum Mechanics II (3 credits)
Prerequisite: PHYS 461
Matrix mechanics, vector spaces and linear operators, perturbation theory, application of principles of quantum mechanics to solid state and nuclear systems.

PHYS 472: Lasers (3 credits)
Prerequisite: PHYS 104, PHYS 321
Study of the concept of laser, spontaneous and stimulated emissions, absorption, pumping process, properties of laser beams, laser resonators, matrix formulation of geometric optics, stable and unstable laser resonators, modes in a laser cavity, loop gain Q-switching, energy levels of molecules.

PHYS 481: Solid State Physics I (3 credits)
Prerequisite: PHYS 221
Study of solids, crystal structure, direct and reciprocal lattices, types of bonding, lattice vibrations, the thermal, electrical and magnetic properties of solids and the effects of crystals.

PHYS 482: Solid State Physics II (3 credits)
Prerequisite: PHYS 481
Free electrons, Fermi gas, nearly free electrons, energy bands, optical transitions, superconductors and magnetic properties.

PHYS 483: Materials Science (3 credits)
Prerequisite: PHYS 321
Study of the properties of material, internal structure of materials, performance of materials during manufacture, production and processing, performance of materials during service, crystal structures, crystal geometry, solidification, crystalline

imperfections, diffusion in solids, thermodynamics and phase diagrams and electrical materials.

PHYS 498*: Internship (6 credits)

For Physics majors with a minimum CGPA of 2.50 and 90 completed credit hours

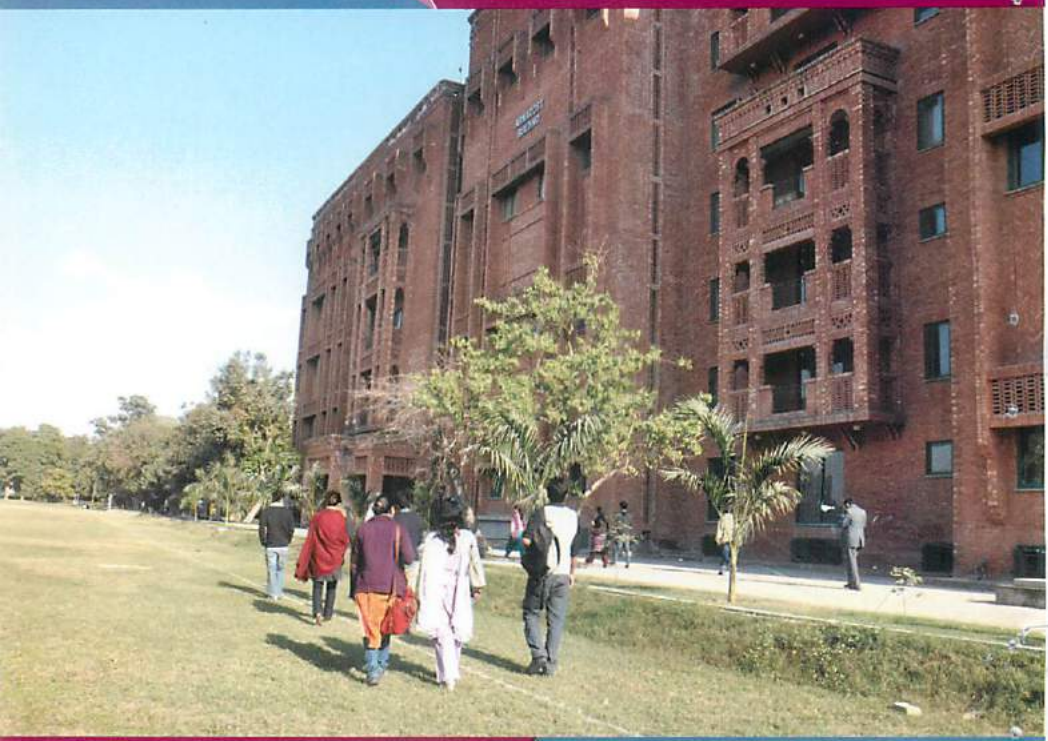
Students will have to work in a well known industry/organization or the university/institute for six to eight weeks and will observe the timings as prescribed by the host organization. Director Internships will act as a liaison officer between the department and the industry/organization, university/institute. The student will have a supervisor from the department as well from the host organization. At the end of the completion of the training students will submit a written report to both the supervisors and will be evaluated by the departmental committee.

PHYS 499*: Senior Thesis Project (6 credits)

For Physics majors with a minimum CGPA of 2.50 and 90 completed credit hours

Each student works on an independent project under the supervision of a faculty member, with the expectations that the student will prepare a senior thesis and will present a seminar on his/her work.

27. Department of Political Science



Introduction

The Department of Political Science at Forman Christian University is one of the largest departments in Social Sciences. The courses offered by the department are open to students majoring in Political Science as well as other disciplines. The department's teaching faculty had the distinction of having scholars of national and international prominence like Dr Carl W Wheeless, Prof Mary Wheeless, Dr Kitchen, Dr Anwar M Barkat, Dr Arshad Karim Syed, Dr Shokat Ali, Dr Hamid Kizilbash, Prof Naseem Zakariya, Dr Parveen Shaukat and Dr Shafqat Hussain Chaudhary.

The quality of instructional work in the department has indeed been of a high standard. Research work is encouraged. There is a dedicated faculty available to teach various papers and supervise research. The department arranges extensive lectures, seminars and study tours to facilitate academic excellence in students. Alumni of this department have contributed positively to national uplift and have excelled in numerous professions.

The department offers a BSc (Hons) degree in Political Science and belongs to the Faculty of Social Sciences.

BSc (Hons) Political Science

The 4-year degree in Political Science encourages students to take courses in the fields of International Relations, Politics of Pakistan and Political Philosophy. Students are encouraged to develop a critical understanding of various phenomena of national and international politics and their abilities to critically evaluate these concepts are nurtured through active classroom discussions.

Learning Objectives

1. Demonstrate in-depth knowledge of the major concepts of politics.
2. Think critically and analytically with a view to developing the habit of lifelong learning.
3. Use appropriate skills for careers in foreign and domestic service, politics, law school, teaching, research and graduate study in Political Science.
4. Function as active citizens in keeping with high ethical standards.
5. Write analytically on an issue and present it effectively to an audience.

Requirements for the Major

Minimum 36 credit hours in Political Science including PLSC 101, PLSC 102, PLSC 103, PLSC 203, PLSC 301, PLSC 302, PLSC 403 and one course in Comparative Politics (PLSC 201 or PLSC 202 or PLSC 312).

Requirements for the Minor

Minimum of 18 credit hours are required for a minor in Political Science which is open to students from any discipline with a minimum CGPA of 2.50.

Core courses required for all minors are PLSC 101, PLSC 102 and PLSC 302.

3 courses from the following must be taken: PLSC 201, PLSC 202, PLSC 203, PLSC 302, PLSC 305, PLSC 310, PLSC 311, PLSC 317, PLSC 321 and PLSC 401.

Course Descriptions

PLSC 101: Introduction to Political Science (3 credits)
Areas covered in political science including the nature of political science, the nature and forms of the state, structure of government, political dynamics, and the development of an appropriate political science vocabulary.

PLSC 102: Pakistan Government-National (3 credits)
A history of the freedom movement and study of the main institutions of the national government and what makes the Pakistan government unique.

PLSC 103: Pakistan Government-Provincial/Local (3 credits)
Government at the provincial and local level with an examination of the basic institutional arrangements of the provincial government, provincial elections, political party organization, state public policy matters and a detailed exploration of the operation of government at these levels.

PLSC 201: Government of Western Europe and the United States (3 credits)
Prerequisite: PLSC 101
Parliamentary, presidential, unitary and federal systems of major western nations.

PLSC 202: Governments of Developing Countries (3 credits)
Prerequisite: PLSC 101
Unique characteristics of governments in Asia and Africa, historical development and a comparison between these nations and the rest of the world.

PLSC 203: International Relations (3 credits)
Prerequisite: PLSC 101
Theory and practice of International Relations using the distinction between realism and idealism as the basis for study, power relationships, theories of war and conflict, international morality, collective security and terrorism.

PLSC 301: Ancient, Medieval and Early Modern Political Theory (3 credits)
Prerequisite: PLSC 101
Political thought from early Greece through the 17th Century using original sources

from philosophers including Aristotle, Plato, Hobbes, Machiavelli, Locke, Rousseau and Hegel.

PLSC 302: Modern Political Theory (3 credits)
Prerequisite: PLSC 101
Modern ideologies since the French Revolution, including liberalism, conservatism, capitalism, nationalism, fascism and anarchism.

PLSC 303: Contemporary Political Theory (3 credits)
Prerequisite: PLSC 101 & 302
Status of rights, utilitarianism, liberalism, communitarian marxist, libertarian and feminism using John Stuart Mill's Utilitarianism on Liberty, Essay of Bentham, Milton Friedman's Capitalism and Freedom.

PLSC 304: Research Methodology (3 credits)
Prerequisite: STAT 101 level course
Techniques and tools for significant research in the field of political science.

PLSC 305: Islamic Political Thought (3 credits)
Prerequisite: PLSC 101
Development of Islamic political thought from ancient times to the present, Muslim thinkers Al-Farabi, Al-Mawardi, Al-Ghazzali, Ibn Khaldun, Shah Waliullah and Allama Muhammad Iqbal.

PLSC 310: Politics of the Middle East (3 credits)
Prerequisites: PLSC 101, PLSC 203
Political development and advance of modernization of the area, the role of Islam, Arab-Israeli conflict, politics of Persian Gulf, politics of OPEC, political parties, military and politics of change.

PLSC 312: Theories of Comparative Politics (3 credits)
Prerequisite: PLSC 101
Political forces, institutions and practices of state, describing, explaining and predicting political events, importance of geographical, racial, ideological, ethnic and socioeconomic explanation of political institutions, processes and behavior, political structure, institutions, ideologies, interest groups and governmental systems, analysis of decision making processes, political conflict and change and group interaction.

PLSC 317: Political Dynamics: Parties and Processes (3 credits)
Prerequisites: PLSC 101, PLSC 102
Two party and multi-party systems including a discussion of what parties are, history of political parties, parties and elections, parties in a federal system and parties around the world.

PLSC 321: Pakistan Foreign Policy (3 credits)
Prerequisite: PLSC 101
Status and relationships between Pakistan and the rest of the world with special emphasis upon relations with the Islamic World and the United States.

PLSC 322: International law (3 credits)
Prerequisites: PLSC 101, PLSC 203
Historical evolution of international law, coverage of classifications of states, rights and duties of jurisdiction, theories of nationalism, diplomatic relations, operation and enforcement of treaties, redress of differences by war and other methods and neutrality.

PLSC 323: International Organization (3 credits)
Prerequisites: PLSC 101, PLSC 203
Background of the United Nations Organization with an analysis of the success and failure of the League of Nations, the Security Council, the General Assembly and the organs of the United Nations and Pakistan's position on the issues.

PLSC 330: Constitutional Law in Pakistan (3 credits)
Prerequisites: PLSC 101, PLSC 102
History and formation and implementation of each of the constitutions of Pakistan and the interpretation of test cases before the Supreme Court of Pakistan.

PLSC 331: Constitutional Law -- United States (3 credits)
Development of American federalism and national power, civil rights and civil liberties, commerce clause and nationalization of the economy, various amendments introduced in the US constitution, role of Supreme Court in American government, the controversy over the interpretation of different approaches to constitutional interpretations.

PLSC 335: Public Opinion (3 credits)
Prerequisite: PLSC 101
General nature of public opinion and its development and application to Pakistan, modern techniques of measurement.

PLSC 336: Public Administration (3 credits)
Prerequisites: PLSC 101, Junior Status
Art of administration, organizational aspects, management agencies, unity under the chief executive, departmental organization, federal-provincial and headquarters field-relationships, line functions, fiscal management, budget strategy and tactics, and government career service.

PLSC 400: Current Political Problems (3 credits)
Prerequisites: PLSC 101, Junior Status
Topical issues and themes of justice, equality and liberty, women's rights, race relations, child labor, birth control and other topics as chosen by the professor and members of the class.

PLSC 401: International Political Economy (3 credits)
Prerequisites: PLSC 101, ECON 100
Phenomena that are both political and economic in nature, substantive issues, methodological and conceptual framework: rational choice theory.

PLSC 402: Islam and Modernity (3 credits)
Prerequisite: PLSC 101
Interrelation of Islam and Modernity by deploying a multi-disciplinary perspective and addressing challenging questions about the nature of Islam's mission in the world, major accounts of modernity's genesis in the West and concomitant decline of religion, historical terrain of modern West's forays into Muslim societies in the era of imperialism and colonialism.

PLSC 403: Seminar and Major Political Science Research Paper (3 credits)
Prerequisite: PLSC 304
Major paper (20 pages minimum) written under the direction of a political science professor.

PLSC 410: Political Science Internship (3 credits)
Open to Political Science majors with a grade point average of 3.00 or above
Working with the national, provincial or municipal government offices, assignments with selected government and civic organizations.

PLSC 412: Foreign Policy Analysis (3 credits)
Prerequisite: PLSC 203
Patterns and processes involved in the formulation of a country's foreign policy, deciphering the apparent 'black box' of state and highlighting the actors, processes and organizations and motives that help to shape a country's foreign policy.

PLSC 413: Critical Theory and Post-Colonial Situation (3 credits)
Prerequisite: PLSC 302 or PLSC 303
Emerging trends in the contemporary theoretical field of post-colonial studies which aims to conceptualize the interrelation of culture, power and knowledge in post-colonial societies, examination of works of Aijaz Ahmed, Ashis Nandy, Partha Chatterjee, Gayatri Spivak, Homi Bhabha, Gyan Parkash, Arif Dirlik, Kwame Appiab and others to raise fundamental questions about the scope, ambitions and epistemological transgression of post-colonial theory.

PLSC 415: Thesis (6 credits)
Prerequisite: PLSC 304
Open to Seniors majoring in Political Science who has maintained a CGPA of 3.50 or above
A detailed research project approved by the department Chairperson and directed by a faculty member in the department.

28. Department of Psychology

Introduction

The undergraduate program in Psychology introduces students to an understanding of the basic core of psychological knowledge, theory, and methods of research and clinical practice. It is an interesting and challenging area of scientific enquiry with the potential to benefit both individuals and society as a whole. The Department of Psychology offers a broad range of undergraduate courses in the major areas of Psychology that are important for understanding mind and behavior.

The department offers both BA (Hons) and BSc (Hons) degrees in Psychology and is part of the Faculty of Social Sciences.

BA/BSc (Hons) Psychology

The 4-year program introduces students to an understanding of the basic core of psychological knowledge, theory, and methods. It is one of the most interesting and challenging areas of scientific enquiry with the potential to benefit both individuals and society as a whole.

Students majoring in Psychology have two options. They can study to earn a BA (Hons) or BSc (Hons) degree. All students majoring in Psychology will initially join the BA (Hons) stream. Students who wish to opt for the BSc (Hons) option need to earn 12 credits by studying various courses offered by the Department of Psychology before applying for the BSc (Hons) option and also need to seek permission from the department.

Learning Objectives

1. Describe major psychological concepts and research findings.
2. Effectively employ research methods used by psychologists.
3. Think critically about psychological concepts, theories and research.
4. Clearly speak and write about psychological material.
5. Analyze real world situations using psychological concepts.
6. Demonstrate increased respect for human unity and diversity.
7. Describe the range of career possibilities with training in psychology.
8. Efficiently use library resources and technology to gather information and solve problems in psychology.
9. Apply ethical principles of psychologists both personally and through socially responsible behaviors.

Requirements for BA (Hons) Major

A minimum of 36 credits including core courses: PSYC 100, PSYC 150, PSYC 220 PSYC 305, PSYC 280, PSYC 340 and PSYC 450.

Requirements for BSc (Hons) Major

A minimum of 48 credits. The following core courses must be taken: PSYC 100, PSYC 150, PSYC 220, PSYC 305, PSYC 315, PSYC 340, PSYC 350, PSYC 450, and PSYC 480.
The BSc (Hons) degree allows students to pursue topics in Psychology with a greater emphasis on hard science, such as neuroscience and cognition. It also has a greater emphasis on empirical research including lab work.

Requirements for Minor

A minimum of 18 credits and is open to students (of all disciplines) with a minimum CGPA of 2.00. In addition to the two core courses, i.e. PSYC 100 and PSYC 150; the remaining courses can be selected from the list of courses offered by the department.

Course Descriptions

PSYC 100: Introduction to Psychology (3 credits)
Historical background and subfields of Psychology, research methods, biological basis of behavior and psychological processes such as sensation, attention, perception, learning, memory, motivation, emotions, intelligence, thinking and personality.

PSYC 150: Developmental Psychology-I (3 credits)
Prerequisite: PSYC 100
Human development from conception to adolescence focusing on physical, intellectual and personality development, special emphasis on development in adolescence and the quest of identity, research activities integrated into the coursework.

PSYC 200: Developmental Psychology-II (3 credits)
Prerequisite: PSYC 150
Human development from adulthood to old age focusing on the physical, intellectual and personality development, life after retirement and problems of old age, death and bereavement.

PSYC 220: Statistics for Psychology (4 credits)
Prerequisite: PSYC 100
Statistical concepts and skills necessary for conducting research and providing an adequate quantitative foundation for understanding psychological literature and SPSS. Covers (a) descriptive statistical techniques including frequency distributions, graphing, and measures of central tendency and variability, and (b) inferential statistical techniques including t-tests, analysis of variance, correlation and chi-square. Emphasises application of statistics and these techniques to research and the interpretation of results.

PSYC 240: Theories of Personality (3 credits)
Prerequisite: PSYC 100
Theories of personality including psychodynamic, trait, cognitive, humanistic, physiological, and learning as well as some new approaches, research activities and

analysis will be integrated in the coursework.

PSYC 280: Social Psychology (3 credits)

Prerequisite: PSYC 100

Nature, scope, historical perspective and research methods, social perception, cognition and identity, interpersonal relationships, attribution, conformity, pro-social behavior, groups, leadership, attitudes, prejudice and aggression. Theories and findings will be related to everyday social issues and concerns.

PSYC 290: Consumer Psychology (3 credits)

Prerequisite: PSYC 100

Methods of studying consumer behavior, basic psychological concepts concerning consumer behavior such as perception, cognition, learning, attitude, cognitive dissonance, risk-taking, motivation and personality of the buyer. Emphasis on the interrelations of economics and socio-cultural factors on decision-making including recent research findings, consumer psychology in Pakistan

PSYC 300: Positive Psychology (3 credits)

Prerequisite: PSYC 100

Positive aspects of human behavior, practical wisdom through a series of exercises in sensitivity and growth, Neuro-Linguistic Programming (NLP), optimism, self-confidence, listening and communication skills, time management, handling criticism, happiness, self-esteem, emotional quotient (EQ), morality, empathy, friendship, love, achievement, creativity, music and humor.

PSYC 301: Industrial and Organizational Psychology (3 credits)

Prerequisite: PSYC 100

Applications of psychological theory and research to the workplace and the means by which industrial/organizational psychology contributes to improved organizational effectiveness and employee satisfaction, recruitment of applicants, hiring, training, evaluation of employees' performance, employee motivation, leadership, and human factors.

PSYC 305: Research Methods in Psychology (3 credits)

Prerequisite: PSYC 220

Research methodology, history of scientific approach, basic elements, methods, design and structure of research with emphasis on data collection, analysis, interpretation and ethics of social science research, research project. Students will write a research proposal.

PSYC 315: Cognitive Psychology including Lab (4 credits)

Prerequisite: PSYC 220

Information processing, attention, memory, concept formation, reasoning, problem solving and decision-making. In lab students will replicate classical cognitive psychology experiments, conduct an empirical research project and present their findings.

PSYC 340: Abnormal Psychology (3 credits)

Prerequisite: PSYC 100

Nature and concepts of abnormality, historical perspective with special emphasis on Pakistan, psychoanalytic, medical, behavioristic; humanistic, and cognitive behavioral models of abnormal behavior; psychological disorders; anti-psychiatry movement; overview of major psychotherapeutic techniques; prevention of mental sickness.

PSYC 350: Biopsychology (3 credits)

Prerequisite: PSYC 100

Behavior and mental processes from the biological perspective with particular emphasis on the role of neurochemical and endocrine factors in the function of the central nervous system, chemical and neural basis of sensory processes, motivation, emotion, learning, memory, language, sleep, reproduction, gender and psychopathology.

PSYC 360: Psychological Testing and Measurement (3 credits)

Prerequisite: PSYC 100

Functions, origins and basic concepts of psychological testing, test construction, ability/intelligence and personality testing, application of psychological tests in educational, occupational and clinical contexts and ethical issues.

PSYC 375: Psychology of Gender (3 credits)

Prerequisite: PSYC 150

Gender stereotypes, the role of biological, cognitive, social, and cultural factors in creating and maintaining gender differences, social roles, attitudes and achievement in males and females, views of women in early psychology and survey of current gender-based scientific research and theory.

PSYC 385: Forensic Psychology (3 credits)

Prerequisite: PSYC 100

Psychological theories and research that address legal issues and the role psychologists play in the criminal justice system. Overview of services provided by psychologists such as expert witnessing, criminal profiling, trial consulting, legal decision making. Assessment and therapeutic services provided to individuals in forensic settings with suspected deviant behaviors. Gender, race, and ethnic differences in criminal violence, causes and effects of violence in media, psychology of sexual assault, victimology, development of habitual criminal behavior and crime prevention are included. The course includes a study tour to Punjab prisons and students prepare a report based on their observations, information obtained during the tour, and classroom learning.

PSYC 430: Health Psychology (3 credits)

Prerequisite: PSYC 100

Psychosocial factors relevant to general health maintenance, recovery from disease or injury, stress management techniques, personality characteristics associated with disease, effects of diet and exercise, theories of pain and pain management, illness prevention, handling chronic illness and psychosocial rehabilitation, developing and maintaining a healthy lifestyle.

PSYC 440: Counseling Psychology (3 credits)

Prerequisite: PSYC 340 or permission of the instructor

Introduction to theories, assessment and approaches to counseling, psychoanalytic, client-centered, behavioral, cognitive behavioral, transactional analysis and rational emotive approaches, educational and occupational counseling, counseling for emotional and sexual problems, family, marriage and community mental health counseling, ethics in counseling.

PSYC 450: History and Systems of Psychology (3 credit)

Prerequisites: For Psychology majors, to be taken during the Senior year or after permission from the instructor.

For non-Psychology majors: PSYC 100 and permission from the instructor.

Historical origin of modern psychology with a focus on Greek contribution, Muslim contribution, European philosophy, and physiology, development of various schools of thought in Psychology including structuralism, functionalism, associationism, behaviorism, gestalt psychology, psychoanalysis, cognitive psychology, humanistic psychology, evolutionary psychology, and some current trends.

PSYC 465: Clinical Psychology (4 credits)

Prerequisites: PSYC 340, PSYC 360

Historical background of clinical psychology, clinical assessment, diagnosis and classification of psychological disorders, and psychological intervention, legal and ethical issues in clinical psychology, case reports (under supervision) with individuals having psychological problems.

PSYC 470: Internship (3 credits)

Prerequisites: PSYC 100, minimum CGPA of 2.75

The course is intended to serve as a bridge between university and career. Internships through the Psychology department are intended to help students to achieve valuable training and work experiences, and to provide a meaningful link between formal coursework and applied professional work. The culmination and tangible product of this internship will be a portfolio containing evidence of what students have done and learned during this course.

PSYC 480: Senior Thesis (6 credits)

Prerequisites: PSYC 305 and permission from the department; open to Seniors majoring in Psychology

PSYC 480 consists of two parts, PSYC 480 A and PSYC 480 B. Students studying PSYC 480 A in the Fall semester need to study PSYC 480 B in the Spring semester.

An independent research study on a topic chosen by the student. The research study will be supervised by a faculty member of Department of Psychology.

29. Department of Religious Studies

Introduction

The Department of Religious Studies has an interdisciplinary approach to the academic study of religion. It provides students a broader understanding of the role of religion in human life. Although most courses offered by the department are on Islam and Christianity, we do not endorse a particular creed or sectarian position. Our aim is to create the context for discussion that allows students to explore academic and personal questions about religion and society. We encourage students to exercise their freedom of expression with respect to diversity.

The department is part of the Faculty of Humanities and offers two degrees: BA (Hons) Islamic Studies and BA (Hons) Christian Studies. The lower division courses for each have been designed to provide students a basic understanding of Islam and/or Christianity, while the upper division courses provide them with deeper knowledge. Religious Studies courses support liberal arts education, independent thinking, and inter-faith relations. The department is part of the Faculty of Humanities.

BA (Hons) Islamic Studies

Learning Objectives

1. Identify intellectual bases of various branches of Islamic Studies to demonstrate good command over the subject matter.
2. Translate the text, derive principles and interpret the Holy Quran, Hadith and other fundamental sources of Islamic studies in accordance with historical, lexical and socio-cultural contexts.
3. Solve everyday problems in the light of Islamic teachings and make decisions that ensure immediate (Here) and ultimate (Hereafter) success in life.
4. Analyze religious doctrines and practices to evaluate their impact on different aspects of human life.
5. Formulate a personal future plan such as teaching, advanced research, self employment, service to the Muslim community.

Requirements for the Major

36 credit hours of core courses: ISLM 104, ISLM 201, ISLM 202, ISLM 301, ISLM 401.
6 credits hours from: ISLM 103, ISLM 302, ISLM 303, ISLM 304.
12 credit hours from: ISLM 305, ISLM 306, ISLM 402, ISLM 403, ISLM 406, ISLM 407.
3 credit hours research project (ISLM 499) or an upper level additional course of 3 credits.

BA (Hons) Christian Studies

Learning Objectives

1. Describe the central theme of the Bible; how each book of the Bible fits into the biblical timeline; and the key biblical teachings.
2. Skillfully use biblical study methods to interpret what effect the original writers intended to have on their readers.
3. Use the Bible, evaluate and solve practical issues of life through ethical attitudes and actions.
4. Critically evaluate claims to truth on the basis of God's revealed truth in the Bible.
5. Formulate a personal career plan which exhibits the values taught and exemplified by Jesus Christ and which contributes to the betterment of Pakistan and especially the Christian community.

Requirements for the Major

Core Courses: CRST 151, CRST 152, CRST 251, CRST 351, ISLM 401
6 credit hours from: CRST 352, CRST 353, ISLM 302, ISLM 305
12 credit hours from CRST 252, CRST 451, ISLM 303, ISLM 306, ISLM 402, ISLM 403, ISLM 406
3 credit hours research project (ISLM 499) is compulsory for successful completion of the degree. A student may take an extra course of upper level in lieu of research project with the approval of the Chairperson of the department.

Minor in Religious Studies

A minor in Religious Studies is open to students of all disciplines with a minimum CGPA 2.00.

Requirements are 18 credit hours including Core courses ISLM 104, ISLM 202 (for Muslim students)/CRST 151, CRST 152 (for Christian students)

Any 1 course from each of the following sets:
ISLM 201, ISLM 301, ISLM 302, CRST 251, CRST 252
ISLM 103, ISLM 303, ISLM 304, CRST 351
ISLM 305, ISLM 306, ISLM 401, CRST 352, CRST 353
ISLM 402, ISLM 403, CRST 451

Course Descriptions

ISLM 101: Islamic Education (3 credits)
Introductory understanding of Islam, Islamic way of life. Students study the logical and rational vindication of their fundamental beliefs, improvement of character traits, personality strengths and social manners in the light of Islamic teachings, improvement of inner conviction about faith, ethical development and character.

ISLM 103: Islamic Ideology (3 credits)
Prerequisite: ISLM 101
Islamic ideology and Islamic way of life, basic and higher order thinking and its practical implication in real life.

ISLM 104: Arabic Communication Skills (3 credits)
Arabic grammar and composition, basic structure of Arabic language; everyday conversation, vocabulary enhancement, translation and composition.

ISLM 201: Tajweed-Ul-Quran (3 credits)
Prerequisite: ISLM 101
Reading and recitation of the Holy Quran, speech sounds of Arabic, Qiraat, Arabic phonology, articulation and accent, pronunciation.

ISLM 202: The Quran – Contents, Style and Interpretation (3 credits)
Prerequisite: ISLM 101
The Holy Quran with its meaning and commentary, compilation of the Holy Quran, content types, general style, selected readings from the Holy Quran, Ulum-al-Quran (collection, exegesis and Ijaz al-Quran) inimitability of the Quran, qualities of Mufassir and different types of interpretations.

ISLM 301: Hadith – Status, Origin and Development (3 credits)
Prerequisite: ISLM 101
Ulum-al-Hadith, authenticity of the sayings of the Prophet (pbuh), importance of Sunnah, codification and compilation of early Hadith literature, review of Hadith collections and reading of selected chapters from Hadith books.

ISLM 302: Islamic Jurisprudence (3 credits)
Prerequisite: ISLM 101 or CRST 152
Definition of law sources of Islamic Sharia, Qur'an, Sunnah, Ijma, Qiyas, Ijtihaad, types of Islamic law, Islamic injunctions and family law, Islamic law and jurisprudence with its historical development.

ISLM 303: Contemporary Muslim World (3 credits)
Prerequisite: ISLM 101 or CRST 152
Geographical, social and cultural features of the modern Muslim world, concept of Ummah, its resources, population, political and economic systems, organizations, challenges to the Muslim world and their solutions.

ISLM 304: Seerat-Un-Nabi (3 credits)
Prerequisite: ISLM 101
Development of biographical studies of the Prophet Muhammad (pbuh), their influence on Islamic thought throughout Islamic history, the Prophet (pbuh) as an example to be followed, the difference between the Prophet's (pbuh) tradition (Hadith) and his biography (Seerah), the Prophet's (pbuh) life before his mission, early period of Makkah

where he faced opposition, migration to Madinah, establishment of the Islamic state in Madinah, treaties and relations with non-Muslims, Ghazwaat and conquest of Makkah and the last sermon and its impact on modern human life.

ISLM 305: Interfaith Relations (3 credits)
Prerequisite: ISLM 101 or CRST 152
Religious pluralism and interfaith relations, historical interaction between major faiths such as Judaism, Islam and Christianity on one hand, and Hinduism and Buddhism on the other is studied, new contents and forms that arise from the modern challenge of interfaith relations, preliminary outlines of the future religions that can coexist comfortably in global community, major features of the current situation, observations as to the future of religions.

ISLM 306: Religion and Science (3 credits)
Prerequisite: ISLM 101 or CRST 152
Relation between modern western empirical science and religion, nature of religion, the nature of science and the epistemologies of science and of religious belief, conflict or concord between religion and science.

ISLM 401: Comparative Study of Religions (3 credits)
Prerequisites: ISLM 101 or CRST 151 and CRST 152
Major religions of the world, cultural contexts, scriptures, fundamental beliefs, practices and sacred art are examined, various global forms of religions, South and East Asian rich traditions of Hinduism, Buddhism, Taoism and Confucianism, monotheistic religions with roots in the Middle East: Judaism, Christianity and Islam, comparative study of religions.

ISLM 402: Islam and the West (3 credits)
Prerequisite: ISLM 101 or CRST 152
Evaluation of western understanding of Islam.

ISLM 403: Modern Islamic Thoughts (3 credits)
Prerequisite: ISLM 101 or CRST 152
Modern Islamic thoughts with the emphasis on Islamic political, economic, social and educational thoughts, political, strategic, economic and social factors underlying modern Islam, comparison of thoughts of Jamaluddin Afghani, Shah Wali Ullah, Allama Iqbal and Syed Muodudi.

ISLM 406: Research Methodology (3 credits)
Prerequisite: Only for majors
Research strategies, research design, various research methodologies and frameworks, management of research, approaches to data collection, survey methods, observation methods, institutional and organizational research, analyzing data, ethics of research and writing a research proposal.

ISLM 407: Teaching of Religious Studies (3 credits)
Prerequisite: 15 credits from this department
Teaching techniques including the spirituality of religious teachers, teaching strategies, classroom management, lesson planning, course designing, assessment and material development.

ISLM 499: Research Project (3 credits)
Prerequisite: 33 credits in Religious Studies
All students majoring in religious studies will be asked to write a research assignment of 50-100 pages on a topic chosen in conjunction with the department faculty. A student may take an extra course of upper division in lieu of research project with the approval of the Chairperson of the department.

CRST 151: Basic Christian Doctrine (3 credits)
Foundational Christian beliefs such as the nature of God, the person and work of Christ, the purpose of the church, the meaning of Christian life and growth, and the nature of God's Word as revealed in the Old and New Testaments.

CRST 152: Christian Ethics (3 credits)
Biblical and theological foundations of Christian ethics with special emphasis on developing the skills necessary to formulate ethical questions and find their solutions in the Bible.

CRST 251: Old Testament (3 credits)
Prerequisite: CRST 152
A study of the literature of the Old Testament with a view to distinguishing its unifying message, understanding the Old Testament historical books within their original cultural, political and historical context, gaining skills in identifying and faithfully interpreting various literary genres, gaining skills in applying the original messages of the various books to contemporary life.

CRST 252: Christian History (3 credits)
Prerequisites: CRST 151, CRST 152
Rise of Christianity from the period immediately following the ministry of Jesus Christ to the contemporary worldwide Christian movement, studying Christians who have made significant impact upon the Church. In addition, the course investigates different Christian movements with special emphasis on Christianity in South Asia from the missionary work of the Apostle Thomas to the present day.

CRST 351: New Testament (3 credits)
Prerequisites: CRST 151, CRST 152
A study of the literature of the New Testament and its fundamental story, focusing on the Gospels, Book of Acts and letters of the New Testament. This course places the events recounted in the New Testament within their first century historical, political and cultural

environment, and applies the original message of the New Testament to life today. The course also discusses fundamental issues regarding ancient New Testament texts and manuscripts.

CRST 352: Christian Theology (3 credits)
Prerequisites: CRST 151, CRST 152
Approaches to presenting a reasonable and rational basis for the Christian faith including investigation of historical evidences, evaluation of philosophical arguments, examination of biblical reliability, and explanation of key biblical teachings.

CRST 353: Jesus Christ: Life, Teachings, and Impact (3 credits)
Prerequisite: CRST 351
Life, ministry and teachings of Jesus Christ within their prophetic, cultural and historical setting as revealed in the four gospels of the Bible with a special emphasis on Bible study methods for communicating his teachings to others.

CRST 451: Paul's Life, Theology and Impact (3 credits)
Prerequisite: CRST 351
A study of the life of Paul, including the political, cultural and religious context of Paul's first century Mediterranean world. In addition, this course will discuss Paul's theology, setting it in the context of the earliest Christian teachings, those of both Jesus Christ and his apostles. Students will survey Paul's 13 letters in light of their origin, purpose, and audience as well as focusing on two of Paul's representative letters.

30. Department of Sociology

BA (Hons) Sociology

The Department of Sociology at Forman Christian College offers a BA (Hons) degree in Sociology which emphasizes the development of sociological skills, observing, analyzing and interpreting the events of human behavior of individuals and groups at the at the family, group, societal, national and global levels.

Learning Objectives

1. Demonstrate mastery of sociological concepts and theories.
2. Apply sociological concepts and theories to real world situations at individual, family, group, national, and global levels.
3. Demonstrate quantitative and qualitative research concepts and skills to conduct simple research projects.
4. Demonstrate critical thinking in the context of sociological and societal issues.
5. Present ideas and research efforts in a scholarly and clear manner in English, both orally and in writing.
6. Demonstrate respect for cultural religious, gender, ethnic and other social diversity at local, regional, national, and global levels.
7. Demonstrate the ethical principles of sociology in working with people as well in conducting research.
8. Apply the knowledge base, thinking and technical skills relevant to the future and present job market in Pakistan and abroad.

Requirements for the Major
Minimum of 36 credit hours (12 courses) which must include the following: SOCL 100, SOCL 201, SOCL 301, SOCL 499 and STAT 103. At least 4 courses must be at the 300/400 level.

Requirements for the Minor
Minimum of 18 credit hours (6 courses) which must include the following: SOCL 100, SOCL 201. At least 2 courses must be at the 300/400 level.

Course Descriptions

SOCL 100: Introduction to Sociology (3 credits)
Presents fundamental concepts of sociology. Helps students to observe and understand the actions, beliefs, and interactions of people in their own and other societies and to think critically about themselves in relation to social structures in their own and other societies at the individual, group and societal levels. Analyzes current social issues in Pakistan and other countries in terms of sociological concepts. Assignments focus on analyzing and interpreting social issues in societies around the world in sociological terms with practical assignments that reinforce classroom learning.

SOCL 101: Introduction to Social Work (3 credits)
An introduction to the values, ethics, history and methods of professional social work practice with particular emphasis on the profession in Pakistan. The course helps students understand the impact of social and economic problems on individuals, families, and communities. The course introduces basic social work principles and techniques to help people help themselves and improve the quality of their lives when experiencing problems due to societal and economic factors such as poverty, homelessness, social discrimination, substance abuse, or involving family issues like parent-child conflict, marital conflict, or caring for aged relatives.

SOCL 150: Sociology of Globalization (3 credits)
Theories of globalization and the history of globalization, various ways in which societies and cultures have been transformed by this phenomenon; analysis of globalization's impact on Pakistani society.

SOCL 201: Sociological Research (3 credits)
Prerequisites: SOCL 100 or another introductory course in the Social Sciences, and Statistics 103.
Presents methodological approaches in social science research, the ethics of social research, and the comparative advantages and limitations of a variety of research orientations, strategies and techniques including experiments, field observations, interviewing, unobtrusive research and surveys. These will be learned through lectures, discussions and reviews of examples, basic method and technique of social research by doing social research projects, skills in observation, interviewing, hypothesis building, theory building, questionnaire construction, computer data manipulation, data interpretation, research report writing, and client support.

SOCL 220: Introduction to Criminology (3 credits)
Prerequisite: SOCL 100
Sociological basis to understand deviancy and criminal behavior, causes and consequences of crime, responses to crime and historical transition of ideas about crime, tools for the scientific investigation of criminal behavior.

SOCL 223: Social and Cultural Anthropology (3 credits)
Races and cultures of our world with a special look at non-western cultures, tools for more effective inter-cultural communications, mirror in which to see our own cultural group more clearly, cultural concepts, and ethnographic description.

SOCL 270: Sociology of Inequality (3 credits)
Prerequisite: SOCL 100
Social inequality, concentrating on class, gender, and ethnicity as relations of domination, structural analysis of these social relationships, their links with each other, and their effects on societies and individuals.

SOCL 290: Political Sociology (3 credits)

Prerequisite: SOCL 100

Social factors underlying political systems such as democracy and totalitarianism, social movements and revolutions, conflict and conflict resolution, voting behavior, and political socialization and the influence of ethnicity, religion, race, gender and caste on politics.

SOCL 291: Economic Sociology (3 credits)

Prerequisite: SOCL 100

Explores the sociology of market and economic activity and the ways that economic activities are modified or impeded by social relations and social institutions. Explores the influence of social institutions and processes on economies and economic decisions.

SOCL 301: Theoretical Perspectives in Sociology (3 credits)

Prerequisite: SOCL 100

Structure and scope of sociological theorizing, how to 'use information and develop reason in order to achieve lucid summations of what is going on in the world and of what may be happening within ourselves" (Wright Mills 1959:5); theory, method and object of investigation of some masters of sociological thought.
Sociological theory as the basis for sociological research.

SOCL 325: Sociology of Gender (3 credits)

Prerequisite: SOCL 100

Cultural values, social institutions and theories in the construction of gender; analysis of gender inequality in contemporary societies and exploration of the social experience of gender across different cultures, roles; statutes and social placement of gender as an outcome of socioeconomic and cultural environment.

SOCL 350 Sociology of Development (3 credits).

Prerequisite: SOCL 100

An in-depth look at development, including theories of development, the impact of development assistance programs, and insights from a wide variety of development models and experiences.

SOCL 355: Sociology of Media (3 credits)

Prerequisite: SOCL 100

Social institution of the media and its impact on society, analysis of the social structure of media organizations, major theories of media effects and their application to Pakistani and other societies, representation of different social groups by media, and media research methods.

SOCL 410: Sociology of Art & Culture (3 credits)

Prerequisites: SOCL 100, SOCL 301

Investigation of cultural issues sociologically, main range of theoretical approaches to the sociology of culture, exploration of sociological viewpoints on the nature of artistic creation and other forms of cultural activity, analysis of what the terms 'high culture' and

'popular culture' may mean, and the stakes that are involved in their use in different social contexts.

SOCL 425: Sociology of Work (3 credits)
Prerequisites: SOCL 100, SOCL 201, SOCL 301
Social groups and how they exercise control over the work environment and make sense of their work experience, central issues to personal identity and social standing, distribution of social power and organization of work, concepts of efficiency, performance, productivity and quality of work from a sociological lens.

SOCL 430: Sociology of Consumption (3 credits)
Prerequisites: SOCL 100, SOCL 201, SOCL 301
Consumption and consumer behavior, trends in consumption by emphasizing socio-cultural aspects of consumption, goods, meanings of signs, political economy of consumption, welfare and well-being and social stratification of consumption, development of consumer behavior by focusing on production, marketing, distribution, sale and appropriation of goods and products having various social identities.

SOCL 435: The Sociology of Aging and Policy Choices (3 credits)
Biological, psychological and sociological changes that occur with aging in Pakistan and other cultures; culture's influence on aging policies in Pakistan and elsewhere; physiological changes occurring with age; social, biological, and psychological theories to explain the aging process; steps students can take to improve their own chances of living to an older age; fact-based understanding of the situation of older people in Pakistan; Pakistan's policies that relate to aging and/or affect older people; issues facing older people in Pakistan. Students gain the ability to identify possible solutions at an individual and policy level.

SOCL 455: Sociology of Religion (3 credits)
Prerequisites: SOCL 100, SOCL 201, SOCL 301
Development of religion in human history; functions of religions for the individual, the religious group and for the society as a whole; organizational structures of religious groups; role of religion in social cohesion and social conflict; the social organization of rituals and religious practices and the phenomenology of religious experiences.

SOCL 465: Sociology of Sport and Leisure (3 credits)
Prerequisites: SOCL 100, SOCL 201, SOCL 301
Cultural and economic relations in sport and leisure including outdoor recreation, spectator sport, informal play, tourism and other entertainment activities from contemporary and historical perspectives with emphasis on the dynamics of power and identity.

SOCL 498: Internship (3 credits)

Prerequisites: Sociology majors and minors who have taken SOCL 100, SOCL 201 and SOCL 301 and have a minimum CGPA of 2.75

An internship in an organization which utilizes the skills learnt in the study of Sociology.

SOCL 499A: Final Year Independent Research Project – First semester (3 credits)

Prerequisites: SOCL 100, SOCL 201, SOCL 301

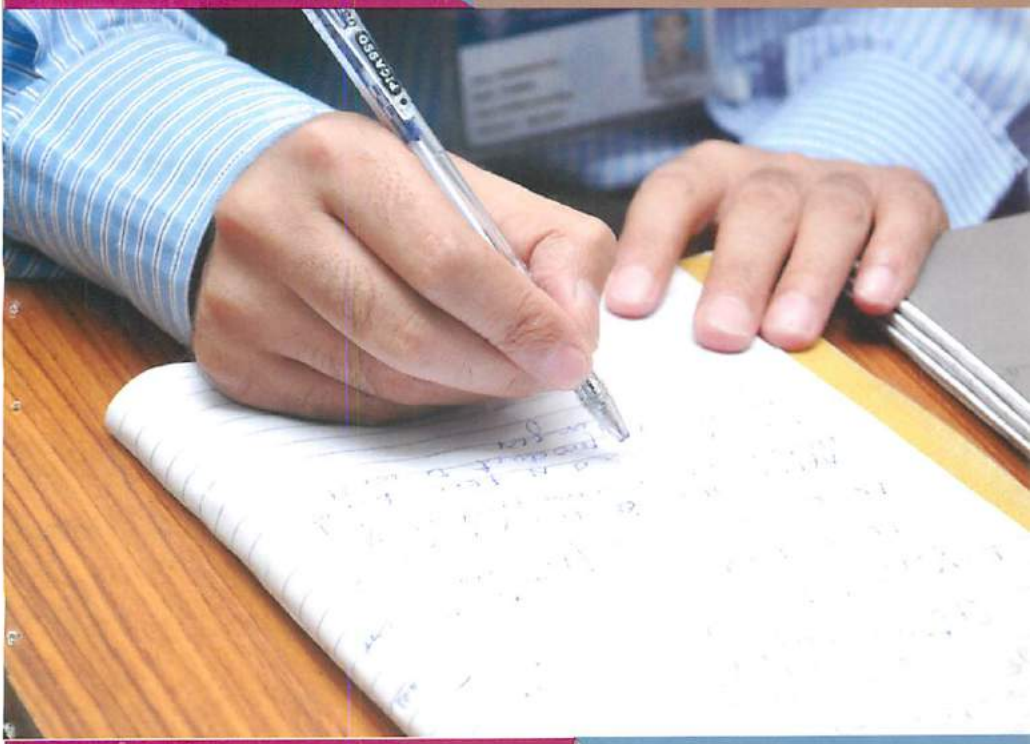
Students select an independent research topic, conduct a literature review, and develop a plan for a proposed research project that includes its methodology, special issues to consider, permissions as needed, and a budget. Work will be done under the supervision of a faculty member in Sociology.

SOCL 499B: Final Year Independent Research Project – Second semester (3 credits)

Prerequisites: SOCL 100, SOCL 201, SOCL 301

Based on the research plan completed in the first semester of this course, the student will carry out his/her research project collecting data, analyzing the data, writing it up, and making a formal presentation of the results to faculty and other students.

31. Statistics



Introduction

The Department of Statistics started functioning in 1974 and has made significant progress with quality faculty and students. It aims to provide a core understanding of statistical concepts with their application to real world problems. The department offers a BSc (Hons) degree and is part of the Faculty of Information Technology and Mathematics.

BSc (Hons) Statistics

Learning Objectives

1. Demonstrate knowledge about basic statistical concepts, terms and techniques.
2. Skills to analyze various types of data and interpret the results effectively.
3. Think critically about applications of statistics in various fields.
4. Practice high moral and ethical values in their personal and professional lives and in their communities.

Requirements for the Major

Minimum of 48 credit hours including STAT 101, STAT 102, STAT 201, STAT 202, STAT 301, STAT 302, STAT 304, STAT 305, STAT 403 and any seven of the following courses: STAT 103, STAT 205, STAT 303, STAT 307, STAT 308, STAT 309, STAT 310, STAT 311, STAT 313, STAT 314, STAT 400, STAT 401, STAT 406, STAT 407, STAT 408, STAT 411, STAT 499.

Requirements for the Minor

A minor in Statistics is open to students of all disciplines with a minimum CGPA of 2.00.

Courses required: Any eight of the following courses: STAT 101, STAT 102, STAT 103, STAT 201, STAT 202, STAT 205, STAT 301, STAT 302, STAT 303, STAT 304, STAT 305, STAT 307, STAT 308, STAT 309, STAT 310, STAT 311, STAT 313, STAT 314, STAT 400, STAT 401, STAT 403, STAT 406, STAT 407, STAT 408, STAT 411.

Course Descriptions

STAT 100: Basic Statistics (3 credits)
Sample and population, variables, collection and presentation of data, measures of central tendency and dispersion for ungrouped data, index numbers, correlation and free hand line of trend.

STAT 101: Statistical Methods (3 credits)
Nature and scope of statistics, scales of measurements, measure of central tendency and dispersion for grouped data, moments, skewness and kurtosis, fundamental rules of counting, basic probability, moments in probability context.

STAT 102: Probability and Probability Distributions (3 credits)
Basic set theory, different approaches and laws of probability, conditional probability, Bayes' rule, random variables, some standard discrete and continuous probability distributions.

STAT 103: Quantitative Methods in Social Sciences (3 credits)
Application of statistical methods in Social Sciences, data analysis using SPSS.

STAT 201: Statistical Inference I (3 credits)
Prerequisite: STAT 101 or STAT 102
Population and sample, introduction to sampling distributions and their properties, point and interval estimation, testing of hypotheses about means, proportions and variances.

STAT 202: Statistical Inference II (3 credits)
Prerequisite: STAT 201
Tests based on Chi-squared distribution, ANOVA and analysis of basic designs, non-parametric tests.

STAT 205: Business Statistics (3 credits)
Application and concept of probability and probability distributions in business, sample and sampling distributions, statistical inference in marketing and business, polynomial models in supply and demand, model fitting through simple and multiple regression.

STAT 301: Sampling Techniques I (3 credits)
Prerequisite: STAT 201
Basic sampling designs with applications, estimation of means, proportions and variances, ratio and regression estimates.

STAT 302: Experimental Design I (3 credits)
Prerequisite: STAT 202
Principles of design of experiments, ANOVA, covariance and underlying assumptions, model and analysis of CR, RCB and Latin Square designs, fixed, random and mixed effect models.

STAT 303: Regression Analysis I (3 credits)
Prerequisite: STAT 201
Estimation of regression parameters, residual analysis, inference about regression.

STAT 304: Distribution Theory (3 credits)
Prerequisite: STAT 102
Random variables and expectations of their functions, theory and application of important discrete and continuous distributions.

STAT 305: Statistical Quality Control (3 credits)
Prerequisite: STAT 101
Control charts for attributes and variables, acceptance sampling plan, quality improvement procedures, Taguchi method of online or offline approach to quality improvement, signal-noise ratios using orthogonal arrays.

STAT 307: Sampling Techniques II (3 credits)
Prerequisite: STAT 301
Probability proportional to size sampling, some well known estimators, selection procedures using unequal probability sampling.

STAT 308: Experimental Design II (3 credits)
Prerequisite: STAT 302
Experiments with more than 2 factors, ANOVA, fixed random and mixed models, factorial designs and experiments, confounding and factorial replication, multiple comparison tests, split plot and nested designs.

STAT 309: Regression Analysis II (3 credits)
Prerequisite: STAT 303
Generalized linear regression, assumptions, diagnostics and remedial measures, inference about parameters, simultaneous equation models, model building.

STAT 310: Time Series Analysis (3 credits)
Prerequisite: STAT 303
Types of time series data, trends, seasonal and cyclical analysis of data, irregular series, short term forecasting, ARMA and ARIMA models, diagnostic checking, forecasts, Box-Jenkin's approach, spectral analysis.

STAT 311: Mathematical Statistics (3 credits)
Prerequisite: STAT 102
Transformation of variables; t, Chi-squared and F distributions with properties, distribution of order statistics, non-central distributions.

STAT 313: Operations Research (3 credits)
Prerequisite: STAT 102
Introduction, mathematical modeling, general linear programming, simplex method, transportation problem, dynamic programming, inventory control, queuing theory, steady state model and its economic analysis.

STAT 314: Reliability Analysis (3 credits)
Prerequisite: STAT 304
Review of probability functions, basic reliability definitions, failure time distribution, exponential time-to-failure models, hazard rates, life testing and reliability estimation of parameters, system reliability.

STAT 400: Acceptance Sampling (3 credits)

Prerequisite: STAT 305

Introduction to acceptance sampling plans, classification of sampling plans, probability and operating characteristic curves, probability functions, single, double, multiple sampling and sequential sampling by attribute.

STAT 401: Stochastic Processes (3 credits)

Prerequisite: STAT 102

Introduction, random walk and ruin problem, Markov chains and Markov processes, power spectra and linear systems, renewal theory, Brownian motion.

STAT 403: Point Estimation (3 credits)

Prerequisite: STAT 304

Properties of estimators, unbiasedness, consistency, sufficiency, efficiency, completeness, methods of estimation, moments, ML, LS, minimum Chi-squares, Bayes method of estimations.

STAT 406: Applied Multivariate Analysis (3 credits)

Prerequisite: STAT 202

Multivariate data, review of multiple regression analysis, PC analysis and factor analysis, canonical correlation, hotelling T procedures, MANOVA, discriminant analysis.

STAT 407: Estimation and Hypothesis Testing (3 credits)

Prerequisite: STAT 304

Interval estimation, Neyman-Pearson Lemma, power functions, uniformly most powerful test, deriving tests of hypothesis for parameters in normal, exponential, gamma and uniform distributions.

STAT 408: Biostatistics (3 credits)

Prerequisite: STAT 102

Introduction, probability distributions of biological variables, probit and logit transformations, ANOVA in biostatistics, developing G test, R x C test of independence.

STAT 411: Survey Methods (3 credits)

Prerequisite: Stat 301

Survey types, construction of survey instruments, benchmarking questionnaires, choosing appropriate research designs, estimation of sample size, pilot survey, preliminary and technical reports.

STAT 499: Research project (6 credits)

Students with CGPA 2.50 or above will be eligible for research; students with CGPA less than 2.50 will have to take any other course from the list of electives.

32. Department of Urdu

Introduction

The Department of Urdu is one of the oldest at Forman Christian College and has had renowned faculty such as Maulana Farzand Ali, Dr Agha Suhail and Prof Iqbal Ahmed Khan. Both teachers and students take an active interest in the fields of research, creative writing and literary criticism. The department has also produced some fine writers. The Department of Urdu offers a BA (Hons) degree and is part of the Faculty of Humanities.

BA (Hons) Urdu

Learning Objectives

1. **Reading:** become accomplished, active readers who appreciate ambiguity and complexity, and who can articulate their own interpretations with an awareness and curiosity for other perspectives.
2. **Writing skills and process:** write effectively for a variety of professional and social settings, practice writing as a process of motivated inquiry, engaging other writers' ideas as they explore and develop their own, and develop an awareness of and confidence in the voice as a writer.
3. **Oral communication skills:** demonstrate the skills needed to participate in a conversation that builds knowledge collaboratively, listening carefully and respectfully to others' viewpoints, articulating ideas and questions clearly, situating ideas in relation to other voices and ideas, and preparing, organizing and delivering an engaging oral presentation.
4. **Critical Approaches:** express ideas as informed opinions that are in dialogue with a larger community of interpreters, and understand how an approach compares to the variety of critical and theoretical approaches.
5. **Research Skills:** identify topics and formulate questions for productive inquiry, identify appropriate methods and sources for research and evaluate critically the sources found, and use their chosen sources effectively in writing, citing all sources appropriately.
6. **Culture and History:** gain a knowledge of the major traditions of literatures written in Urdu, an appreciation for the diversity of literary and social voices within and sometimes marginalized by those traditions, develop an ability to read texts in relation to historical and cultural contexts in order to gain a richer understanding of both text and context, and become more aware of self as situated historically and culturally.

Requirements for the Major

Minimum of 36 credit hours including: URDU 201, URDU 204, URDU 208, URDU 302, URDU 405 and URDU 406 (research project).

Requirements for the Minor

A minor in Urdu is open to students of all disciplines with a minimum CGPA of 2.00.
Core courses required: URDU 104, URDU 208 and URDU 303.
3 courses from the following: URDU 103, URDU 201, URDU 202, URDU 205, URDU 206, URDU 207, URDU 301, URDU 304, URDU 305, URDU 306, URDU 401, URDU 402 and URDU 403.

Course Descriptions

URDU 101: Communicative Urdu (3 credits)
Communication and its different means, brief introduction to Urdu language, some fundamentals of Urdu grammar, functional Urdu, creative writing and journalistic Urdu.

URDU 103: A Selection of Urdu Verse (3 credits)
Ghazal (Ghalib, Mir and Iqbal), nazam (Nazeer Akbar Abadi, Akbar Allah Abadi, Majeed Amjad and Syed Zamir Jafri).

URDU 104: A Selection of Urdu Prose (3 credits)
Letters (Ghalib), essays (Sir Syed Ahmad Khan, Wazir Agha and Mushtaq Ahmad Yousfi), short story (Premchand), character sketch (M Abdul Haque), extract of travelogue (Begum Akhtar Riaz-ud-Din).

URDU 201: A Brief History of Urdu language and Literature (3 credits)
Introduction to Urdu language and theories regarding its origin, phases and trends in Urdu literature up till the 20th Century, Urdu in Delhi and Lucknow, evolution of Urdu prose.

URDU 202: Classical Urdu Poetry (3 credits)
Introduction to classicism, study of classical ghazal (Mir Taki Mir, Khawaja Mir Dard, Haider Ali Atish, Momin, Asadullah Khan Ghalib), masnawi (Mir Hassan) and marsya (Mir Anees).

URDU 203: Introduction to Satire & Humor in Urdu Literature
Difference between satire and humor, a brief history and importance of satire and humor, prose (Patras Bukhari, Ibn-e-Insha, Mushtaq Ahmad Yousfi, Col Muhammad Khan), poetry (Akbar Illahabadi, Syed Muhammad Jaffri, Syed Zamir Jafri, Anwar Masood).

URDU 204: Urdu Grammar and Literary Terms (3 credits)
Ilm-ul-Bayan, Ilm-ul-Badih, Adabi Istalahat.

URDU 205: Pakistani Poetry (3 credits)
Pakistani poetry (Munir Niazi, Shahzad Ahmad and Ahmad Faraz), nazam (Munir Niazi, Anwar Masood, Parveen Shakir and Amjad Islam Amjad).

URDU 206: Pakistani Prose (3 credits)
Pakistani fiction and prose: novel by Abdullah Hussain and short stories by Ahmad Nadeem Qasmi, Mumtaz Mufti and Bano Qudsia.

URDU 207: Literary Journalism (3 credits)
Difference between journalistic and literary use of language, evolution of literary journalism in Urdu, leading literary journals (Tehzeeb-ul-Ikhlaq, Awadh Puch, Saqi, Adbi Dunya, Naqoosh and Fanoon).

URDU 208: Script Writing in Urdu (3 credits)
Documentary writing: program scripts, journalistic scripts, business scripts, drama and film scripts.

URDU 301: Modern Urdu Poetry (3 credits)
Modernity and Modernism, ghazal (Hasrat Mohani, Faiz Ahmad Faiz, Nasir Kazmi), nazam (Majeed Amjad, Faiz Ahmad Faiz), lyrics (Hafeez Jalandhry), an analysis of Urdu poetry in the 20th century in a nutshell.

URDU 302: Criticism (3 credits)
Basic principles and definition of criticism, oriental criticism, western criticism, practical criticism.

URDU 303: An Introduction to Selected Genres (3 credits)
Poetic and prose genres of Urdu literature: ghazal, nazam, rubai, qata, haiku, dastaan, novel, drama and character sketch.

URDU 304: Biographical Literature in Urdu (3 credits)
Evolution of biographical literature in Urdu, biography of Khawaja Altaf Hussain Haali.

URDU 305: Autobiographical Literature in Urdu (3 credits)
Evolution of autobiographical literature in Urdu, autobiographers: Abdul Majeed Salik, Rashid Ahmed Siddiqui, Ihsan Danish and Qudrat Ullah Shahab.

URDU 306: Travelogues in Urdu (3 credits)
Evolution of travelogues in Urdu, selected extracts from Mahmood Nizaami, Begum Akhtar Riaz-ud-Din, Ibn-e-Insha and Mustansar Hussain Tarrar.

URDU 401: Study of Iqbal (3 credits)
Life sketch of Iqbal, Iqbal as a poet and selected Urdu ghazals and nazams.

URDU 402: A Study of Urdu Drama (3 credits)
Art and evolution of Urdu drama, selected extracts from Anarkali, Mirza Ghalib Bandar Road Per and Man Chalay Ka Soda.

URDU 403: Modern Literary Movements in Urdu (3 credits)
Literary movements, modernity and modernism, important movements of the 20th century, romanticism, progressive movement, symbolism, modernism.

URDU 405: Principles of Literary Research (3 credits)
Importance of literary research, evolution of Urdu research up till Aab-e-Hayat by M Hussain Azad, principles and resources of research, terminology and preparation of research paper.

URDU 406: Practical Research (3 credits)
A research paper of 50-100 pages on any topic regarding Urdu language and literature.