

Self Assessment Report

**INSTITUTE OF COMPUTING AND INFORMATION
TECHNOLOGY (ICIT)**

MISSION, OBJECTIVES AND OUTCOMES

Vision

To become an internationally acclaimed IT Institute that serves society through excellence in education and research.

Mission

ICIT aspires to achieve excellence and national/international leadership through unparalleled teaching and research, holistic undergraduate education to serve the critical needs of society. It seeks to accomplish this mission as a unified institution with cutting-edge research, a modern and rigorous curriculum recommended by Higher Education Commission and socially responsible outreach to the nation and region.

ICIT Philosophy

Merit Based Approach

ICIT adheres to merit as the sole criteria in its decision making. This applies to all aspects of its operations, from selection of faculty and staff, to admission and evaluation of students.

Hard Work

We believe that sustained hard work provides the underpinning for the socio-economic development of a nation. ICIT academic programmes help develop the stamina and diligence essential for success in the increasingly competitive environment.

Value Addition

Our programmes are structured so that every activity enhances student learning and individual development. All activities are thus designed with definite learning objectives.

Intellectual Rigor

The programmes offered at ICIT not only require the capacity to work hard, but also the ability to think analytically and to solve problems. The mental strength that comes from a rigorous academic programme prepares the participants to perform demanding intellectual tasks.

Character Building

We consider character building to be an integral aspect of our programmes, as learning without personal integrity will be of little value to the individual and the society.

Institute of the Future

- Institute dedicated to advancement and creation of new knowledge
- A place for holistic experience and strong education
- A diverse community with a distinctive commitment to ethics, tolerance, and social responsibility.

Master in Computer Science Program

(Program Mission, Objectives and Outcomes)

Standard 1-1: The program must have documented measurable objectives that support faculty / college and institution mission statements

Mission Statement for MCS:

ICIT aims to provide the facilities to train the incoming students up to the extent that they can meet the requirement of country when they are supposed to work in teaching / Research institutions or in industries in Pakistan or abroad. Broadly produce skilled manpower in the specified field of the country.

Program objectives

The Master in Computer Science programme is intended to produce graduates who are:

1. Able to design, implement and test software/s in the computer industry.
2. The courses ensure that the programme provides for training in software skills, both in theory and its application. The curriculum includes a large number of laboratory-based courses, which give the students the opportunity to learn things hands-on.
3. The programme provides graduates the skill and knowledge necessary for a successful career in computer Science, and enables them to pursue higher studies in computer Science or related disciplines.

Objective	How measured	When measured	Improvement identified	Improvement made
1,2,3	a) Student Course Evaluation Questionnaire	Jan 2012	<ul style="list-style-type: none">• No proper utilization of study hours by the students.• Lack of e-learning	

	b) Survey of Graduating Students	2012	<p>resources.</p> <ul style="list-style-type: none"> • Minimal utilization of Computer Labs. by the students, • Shortage of books. • To achieve Program objectives, more attention is needed • Infrastructure 	
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Standards1-2: The program must have documented outcome for graduating students. It must be demonstrated that the outcome support the program objective and that graduating students are capable of performing these outcomes.

Program Outcomes:

The program prepares students to attain the educational objectives by ensuring that students demonstrate achievement of the following student outcomes.

1: An ability to identify, formulate, analyze, and solve problems, as well as identify the computing requirements appropriate to their solutions.

2: An ability to design, implement, and evaluate software-based systems, components, or programs of varying complexity that meet desired needs, satisfy realistic constraints, and demonstrate accepted design and development principles.

3: An ability to apply knowledge of computing, mathematics, science, and engineering appropriate to the discipline, particularly in the modeling and design of software systems and in the analysis of tradeoffs inherent in design decisions.

4: An ability to use current techniques, skills, and tools necessary for professional practice.

5: An ability to design and conduct experiments appropriate to the discipline, as well as to analyze and interpret data.

6: An ability to function effectively on multidisciplinary teams to accomplish a common goal.

7: An ability to communicate effectively with a range of audiences.

8: An understanding of professional, ethical, legal, security, and societal issues and responsibilities appropriate to the discipline.

9: An ability to analyze the impact of computing and software solutions in an individual, organizational, societal, global, and economic context.

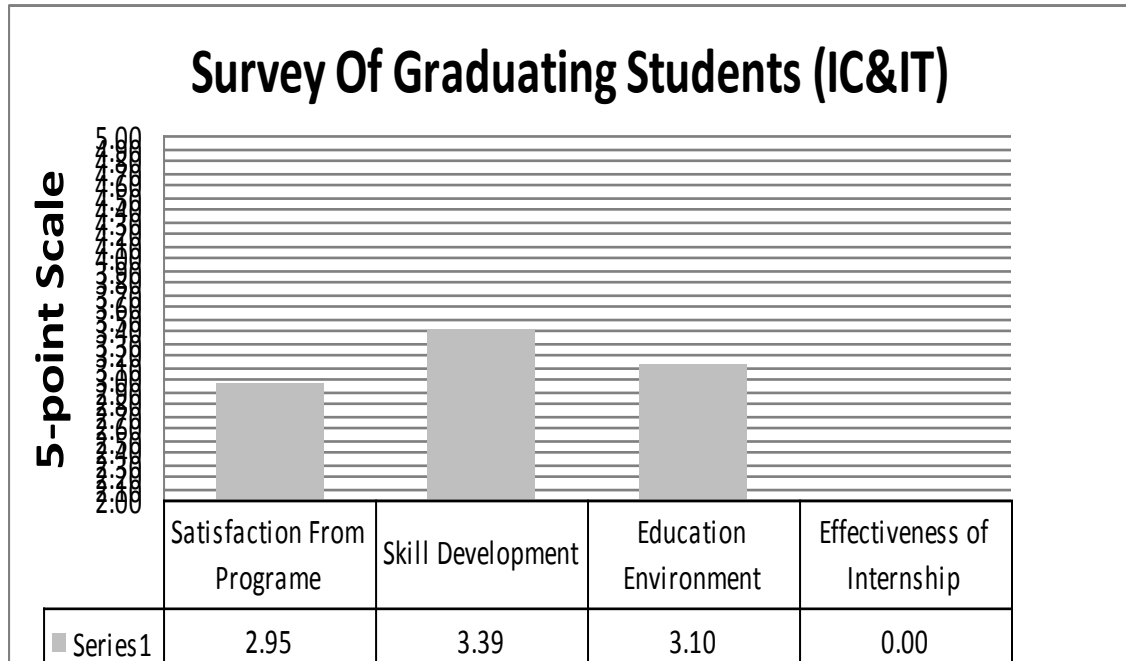
10: A knowledge of contemporary issues appropriate to the discipline.

11: A recognition of the need for and an ability to engage in life-long learning and continuing professional development.

Program Objectives	Program Outcomes										
	1	2	3	4	5	6	7	8	9	10	11
1	√	√	√	√							√
2	√				√	√	√				
3		√							√	√	√

Standard 1-3: The results of programs assessment and the extent to which they are used to improve the program must be documented

After the assessment of Graduating students' survey, the strength and weaknesses identified.



- **Areas for improvement**

- Program objective achievement need more attention
- Infrastructure
- Lack of lab equipment for practical work
- Oral & Written communication skills

Describe the actions taken based on the results of periodic assessments

Actions to be taken on the recommendations of AT visits

- **Strength and weakness of the program**

Strengths:

- Program smoothness
- Independent thinking and teamwork
- Skill Development
- Educational Environment

Weaknesses:

- Program objective achievement needs more attention
- Lack of Responsibilities in official work.
- Lack of practical work

- Lack of Lab equipment
- Class room environment not conducive for learning
- Oral & Written Communication Skill
- **List future development plan for the program**
 - New Extension Block
 - New and advanced curriculum
 - Stress on Research Work
 - Latest Labs Equipments

Standard 1-4: The department must asses its overall performance periodically using quantifiable measures.

Present students enrolment (MCS)

Years	No of students	No of graduate students
2011	50	44
2010	52	40
2009	55	45

Criterion 2: Curriculum Design & Organization

- A. **Title of Degree Program:** MCS
- B. **Definition of credit hour:** One credit hour means a class of one hour per week for one term/ semester. One term means 15 weeks continuous duration program. However in case of Lab work, two hours Lab work means one credit hour.
- C. **Degree Plan:** The table-1 shows the course division of the program.
- D. **Curriculum breakdown:** No breakdown available for the courses. Needs improvement

Figure: 1

Following matrix links courses in the program to program outcomes

	Courses	Program Outcomes										
		1	2	3	4	5	6	7	8	9	10	11
1st term	Digital Logic and Design	√				√			√			√
	Introduction to Object Oriented Programming		√	√	√				√			
	Data Structures and Algorithms			√		√			√		√	√
	Discrete Structures					√						
	Functional English			√		√		√		√		√
2nd term	Database Systems	√				√					√	
	Automata Theory	√		√			√					
	Design and Analysis of Algorithms			√			√				√	√
	Operating Systems		√		√		√			√		√
	Advanced OOP	√		√			√			√		
	Introduction to Signal Processing	√						√		√		
3rd Term	Microprocessors and Assembly language	√		√		√		√			√	
	Software Engineering-I	√			√						√	√
	Visual Programming				√		√			√		√
	Data Communications	√	√	√		√			√			√
	Communication Skills	√		√	√	√		√			√	
	* Project		√			√					√	
4th Term	Artificial Intelligence	√		√			√			√		
	Computer Architecture	√	√	√		√			√			√
	Theory of Compilers		√			√				√	√	
	Computer Networks	√		√			√			√		
	Software Engineering-II		√			√				√	√	
	Project	√	√	√		√			√			√

Table 1: Courses versus program outcomes

Standard 2-2: Theoretical background, problems analysis and solution design must be stressed within the program’s core material.

Elements	Courses
Theoretical	Digital Logic Design, Functional English, Operating Systems, Introduction to Signal Processing, Data Communications, Communication Skills, Artificial Intelligence,
Problem Analysis	Software Engineering-I, Software Engineering-II, Object Oriented Modeling, Data Base Management System, Design and Analysis of Algorithms, Computer Networks.
Solution Design	Theory of Automata, Theory of Compilers, Discrete Structure, Distributed Data Bases, Object Oriented Programming, Data Structure and Algorithms, Advanced Object Oriented Programming, Visual Programming, Microprocessors and Assembly language, Projects.

Table 2: Fulfilling requirements in standard 2-2

Standard2-3: The curriculum must satisfy the mathematics and basic sciences requirements for the program as specified by the respective accreditation body

All the courses specified by the respective accreditation body i.e. HEC has been introduced and taught accordingly.

Standard 2-4: The curriculum must satisfy the major requirements for the program as specified by the respective accreditation body

The curriculum of the program has fully satisfied the major requirements and objectives of the program.

Standard 2-5: The curriculum must satisfy humanities, social sciences, arts, ethical, professional and other discipline requirements for the program as specified by the respective accreditation body

As per approval of HEC our syllabus contains all the subjects.

Standard 2-6: Information technology component of the curriculum must be Integrated throughout the program

The curriculum satisfies 2-6 as a whole. The standard 1-4 can also be cited.

Standard 2-7: Oral and written communication skills of the students must be developed and applied in the program

Oral and written communication has been given importance in the program. Students have the compulsion to take following English courses to improve their communication skill:

- English (Study Skills)
- Communication Skills

Students' oral and written communication skill is satisfactory but it needs some improvement.

Criterion 03: Chemistry Lab

Lab Title	Location & area	Objectives	Adequacy for Instruction	Courses Taught	Major apparatus and Equipments	Safety regulations and first aid box
Lab I	Main Building ICIT WxL 30x50	To train MCS(male) students from all the departments of University.	MCS Prev: MCS Final	MCS Courses Designed for Problem Analysis and Solution Design.	1. Multimedia Projector 2. Computers and related accessories.	Not available
Lab 2	Main Building ICIT WxL 30x50	To train MCS(female) students	MCS Prev: MCS Final	MCS Courses Designed for Problem Analysis and Solution Design.	1. Multimedia Projector 2. Computers and related accessories	Not available
MS Lab	Main Building ICIT WxL 30x50	To train MS students of the Department	M. S/Ph. D.	MS/PhD courses designed according to HEC requirements.	1. Multimedia Projector 2. Computers and related accessories	Not available

Standard- 3-1: (Lab manuals/documentation/instruction for experiments must be available and readily accessible to faculty and students.

Lab manuals are not available. No facility to overcome electric shocks in the Lab is available.

Standard 3-2: There must be adequate support personal for instruction and maintaining the computing laboratories

Lab Assistants and attendants help in conducting the Lab activities; each lab has more than one Lab Assistant.

Standard 3-3: The university computing infrastructure and facilities must be adequate to support programs objectives.

Computer lab is established and equipped with computers but no access to students to take benefits from Digital library and other e-learning facilities. The internet Lab facility in the department needs improvement to fulfill the requirements of e-learning.

Criterion 4: Student Support and Advising

Standard 4.1: Courses must be offered with sufficient frequency and number for students to complete the program in a timely manner.

All the courses are first discussed by departmental academic committee. The recommendations are then discussed in the Board of Studies meeting comprising of some senior professors of the university and experts of curriculum from other universities and affiliated colleges. The recommendations of this board are further submitted to Academic committee for approval and onward submission to the syndicate.

Standard 4-2: Courses in the major areas of study must be structured to ensure effective interaction between student, faculty and teacher assistants.

In MCS programme students are allowed to directly interact with teacher on and off in the department. Teaching Assistants in this department are not available. However, proper procedure to assign the responsibility to structure courses and to maintain the consistency of contents is available. Improvement needs in this area to fulfill the requirements.

Standard 4-3 Guidance on how to complete the program must be available to all students and access to academic advising must be available to make course decisions and careers choices.

A faculty member is assigned responsibility to discuss and coordinate with student in taking major optional courses. Also a faculty member is responsible for organizing seminars, visits of the students to different universities.

Criterion 5: Process Control

Standard 5-1: The process by which students are admitted to the Program must be based on quantitative and qualitative criteria and clearly documented. The process must be periodically evaluated to ensure that it is meeting its objectives.

A very transparent system for admission in MCS. NTS test and interview is taken for admission. Admission in this program based on the following selection criteria.

1. The candidate must qualify NTS test to appear in interview.(40%)
2. Candidate must have passed BSc at least 2nd division.
3. Candidate must have Computer subject in the bachelor degree.

4. Merit formula: (60%)

$$\text{SSC} *1 = X$$

$$\text{HSSC}*2 = Y$$

$$\text{B. Sc}*3 = Z$$

$$\text{Merit} = X+Y+Z / 6$$

Standard 5-2: The process by which students are registered in the program and monitoring of students progress to ensure timely completion of the program must be documented.

At the start of term applications are invited through leading news papers. After getting the applications students are scrutinized with reference to pre-requisite of the program. Merit list of eligible candidates is prepared according to the formula given in standard 5.1

To monitor the students' performance we have internal as well as external base evaluation system. In every term at least 2 tests are conducted which carry 20 % marks along with assignments at the end of the term, external exam is conducted for 80 %. The result is based over these combined assessments of the students.

Standard 5-3: The process of recruiting and retaining highly qualified faculty members must be in place and clearly documented. Also processes and procedures for faculty evaluation.

In order to attract qualified faculty , different domains of computing are defined in the programs as per the expertise required , demand for the staff along with the expertise details is sent to Administration for advertising the positions in leading English and Urdu News papers. As the application forms are received, the scrutiny committee short lists the applicants for the screening test as per criteria advertised. A third party is involved for conducting the test to make the process transparent. Successful candidates of the test are interviewed through a selection board in which a panel of experts is present. After the selection board syndicate approves these selections, there after appointment is offered to the candidate.

There was no systematic process before to evaluate the faculty members, now after establishment of QEC each faculty member is evaluated by the students via “Teacher Evaluation Questionnaire”.

Standard 5-4: The process and procedures used to ensure that teaching and delivery of course material to the students emphasize active learning and that course learning outcome is met. The process must be periodically evaluated to ensure that it is meeting the objectives.

In order to ensure that the teaching is effective, a quarterly survey is conducted by the University QEC and the findings are communicated to the concern faculty members. After completion of survey a meeting of assessment team is called to review the assessment report and to make implementation plan for the said department.

Standard 5-5: The process that ensures that graduates have completed the requirements of the program must be based on standards, effective and clearly documented procedures. This process must be periodically evaluated to ensure that it is meeting its objectives.

Proper procedures is present to assure that the graduate meet the program requirements. But periodic meetings to ensure that objectives are fulfilled are not conducted as per present procedure. This area requires attention of the department.

Criterion 06: Faculty

Standard 6-1: There must be enough full time faculty who are committed to the program to provide adequate coverage of the program areas / courses, continuity and stability. The interests and qualifications of all faculty members must be sufficient to teach all courses, plan, modify and update courses and curricula. All faculty members must have a level of competence that would normally be obtained through graduate work in the discipline. The majority of the faculty must hold a Ph. D. in the Discipline.

The following table indicate program areas and number of faculty in each area

Program Area	Courses in the area and average number of sections per year	Number of faculty members in each area	Number of faculty with PhD
MCS	Digital Logic Design, Functional English, Operating Systems, Introduction to Signal Processing, Data Communications, Communication Skills, Artificial Intelligence, Software Engineering-I, Software Engineering-II, Data Base Management System, Design and Analysis of Algorithms, Computer Networks. Theory of Automata, Theory of Compilers, Discrete Structure, Object Oriented Programming, Data Structure and Algorithms, Advanced Object Oriented Programming, Visual Programming, Computer Architecture, Projects.	13	4
S.Total :		13	4
Total		13+4 =17	

Standard 6-2: All faculty members must remain current in the discipline and sufficient time must be provided for scholarly activities and professional development. Also, effective programs for faculty development must be in place.

ICIT has number of faculty members involved in research work and professional development. Research seminars are arranged. Improvement needs to arrange refresher courses and research workshops.

Standard 6-3: Faculty members should be motivated and have job satisfaction to excel in their profession

There are different programs for faculty benefits and there motivation i.e.

- 1) Reasonable work load and class size as per the HEC requirement for getting quality education.
- 2) Attractive salary packages.
- 3) Paid vacations.
- 4) Hard area allowance.

Criterion 07: Institutional Facilities

Standard 7-1: The institution must have the infrastructure to support new trends in learning such as e-learning

ICIT have the infrastructure to support new trends in learning, but this area needs much improvement to meet the day to day requirement. Improvement is needed for this section.

Standard 7-2 : The library must possess an up to date technical collection relevant to the program and must be adequately staffed with professional personnel

The departmental library has the collection of latest books with professional staff. The total numbers of books in the library are

Name of Item	Quantity
Books	10000

Central Library:

The central library has also facilitates the ICIT students but with small number of books. Our central library does not have the sufficient number of books in Computer relevant subjects. No e-learning facility is provided in central library. Improvement needs in this section.

Standard 7-3: Class-rooms must be adequately equipped and offices must be adequate to enable faculty to carry out their responsibilities

Class room shortcomings

- 1. Multimedia:** No multimedia present in the classrooms.
- 2. Sound System:** No sound system present.
- 3. Desks / Chairs:** Desks and chairs are present but their condition is not good.
- 4. Light System:** Light system is present but not up to the requirements and classroom standards.

Offices are not adequate to enable faculty to carry out their job responsibilities.

Criterion 08: Institutional Support

Standard 8-1: There must be sufficient support and financial resources to attract and retain high quality faculty and provide the means for them to maintain competence as teacher and scholar.

All the financial matters of ICIT are run by University Finance Directorate and very little is left at department level. The university provides all the financial support needed to run the programs of studies in ICIT. Salaries of the faculty as well as supporting staff are facilitated by the university. The compensation including benefits like housing and children's Education is also provided by the administration.

Standard 8-2: There must be an adequate number of high quality graduate students, research assistants and PhD students.

Currently ICIT has the students enrolled in MCS and in M.S/Ph.D. But no research assistants are supported by the university. Still there are also some problems faced by the students during studies and research.

1. Lack of computers, printers, network equipment and software support.
2. Lack of funds for the functioning of research equipment.

Standard 8-3: Financial resources must be provided to acquire and maintain library holding, laboratories and computer facilities

All the financial resources are captured by the finance department of the university. For the maintenance/purchase of the equipment a lengthy procedure is followed, which often ends at the constraint "NO FUNDS".