GANDAKI COLLEGE OF ENGINEERING AND SCIENCE

(Affiliated to Pokhara University)

BE Software
BE Computer

MSc Information System Engineering

> **BECOMING MORE RESPONSIVE TO THE EVER-CHANGING NEEDS OF THE STUDENTS AND THE ENGINEERING PROFESSION**

Message
from the Campus Chief

"Pursue Excellence Together: Be professional and serve the nation"

Dear Students, Parents and Well Wishers

It gives me a great pleasure to welcome you in Gandaki College of Engineering and Science (GCES). The College has tried to capture the ideas from diverse academic disciplines applied to engineering field. Gandaki College of Engineering and Science (GCES) was established in 1998 AD asthe first community technical college aimed at generating engineering technicians under the "Gandaki Public Education Trust" and affiliated to the Pokhara University. It has been functioning as a non-profitable educational institution and has been registered under Public Education Trust. The college is committed to the development of highly skilled engineering manpower in software and computer disciplines as per the country's requirement. It offers Bachelor (Software and Computer engineering) and Master (Information System Engineering)level programs in Engineering.

The vision of the college is: "Becoming more responsive to the ever-changing needs of the students and the engineering profession". The College is experiencing a period of significant growth because it offers an impressive range of academic resources. The family of GCES seeks to empower students to develop a passion for lifelong learning and nurture them by engaging their intellect, emotions and natural curiosity. We develop students' competence and motivation that will enrich self-esteem. Our daily work includes creating a safe and supportive environment in which all learners can pursue academic and social learning experiences and fulfil their unique potentials.

The College is enormously benefited by the wide range of perspectives and talents brought in by the students, faculties and staffs from a variety of backgrounds. The College also offers a wide range of social, cultural and recreational activities with the belief that students take a little time from their studies to enjoy some of these benefits as well. GCES always leads the students to cultivate the Knowledge, promote the Character and empower the Service for the nation.

As the Campus Chief, I express my commitment for the highest quality in the Bachelor and Master level programs and promise that these programs are built on a sound foundation of excellence and innovation. The college creates a common platform for students, professionals, industrialists and entrepreneurs to coordinate and communicate for the technology development and empowerment of engineering education.

– Birendra Khadka, M.Phil
Campus Chief

Introduction

Gandaki College of Engineering and Science (GCES) is a tertiary education facility in the beautiful city Pokhara. It was founded in 1998 and officially inaugurated in 1999. The college runs under the non-profitable "Gandaki Public Education Trust", and is affiliated to Pokhara University, located in the premises of Gandaki Boarding School (GBS), Lamachaur, Pokhara.

Currently the college offers Bachelors Engineering program in Software Engineering (B.E. Software) andComputer Engineering (B.E. Computer), and Masters of Science in Information System Engineering (M.Sc. ISE). The college is a non-profitable institution owned by the Ministry of Education, Nepal and is managed by the "Gandaki Public Education Trust".

GCES has always been driven by the mission of becoming an international center of academic excellence with its motto"Knowledge, Character, and Service". Our programs prepare students for different areas in the field of Computer Engineering, Software Engineering, and specialized field of Information Systems Engineering. They not only prepare students to excel in their subject matters, but open wide domain of ideas and knowledge, values, and research skills as well.

A unique feature of our academic programs is the focus in projects and practical along with sound theoretical background. Students utilizing this opportunity are exceptionally well prepared for the industry jobs, imparting entrepreneurial and research skills. GCES is refining engineering education via the integration of methods, research projects and creative learning.

Vision

- To become a centre of excellence and resource centre contributing tothe nation through excellence in Scientific and Technical education, knowledge creation and research.

Mission

- To improve the well-being of the economically and socially disadvantaged people in the society by creating and advancing knowledge to our students and professionals.
- To provide quality education in information and communication technology that encourages students to compete successfully in the technology field
- To cultivate an atmosphere of intellectual discipline that encourages and facilitates both students and faculty with some scholarships to the students, and hence prepare engineering professionals with knowledge, values and skills which will enable them to make a significant contribution to the nation and the global village.
- To fulfill its mission with a deep concern for socially and economically disadvantaged members of its community.
- To develop the institute as the internationally recognized academic centre.

Core Values

- Academic Excellence
- Leadership
- Honesty and Integrity
- Accountability and Transparency
- Encouragement
- Social Responsibility

Motto

"Knowledge Character Service"

Our Team

Infrastructure

The college resides in the beautiful campus of around 270 ropani of land, along with the Gandaki Boarding School, in the yard of beautiful snow-capped mountains around, and the unique natural landscape of Lamachaur. It is 4 km North-West from the centre of Pokhara valley. The college has its main academic building Dr. PV Chandy Building equipped with facilities of modern amenities like Computer Laboratories, Mechanical Workshop, Electrical and Electronics Laboratories, Library, well equipped ICT Centre, Sporting Facilities and Swimming Pool.

Academic Programs: Undergraduate Level

B.E. Software

Bachelors of Software Engineering program is a 4-year (8 semesters) 129 credit undergraduate engineering program. Graduates of this program possess knowledge and skills of a defined engineering approach to complex systems analysis, planning, design and construction. The program has a unique, project-driven curriculum, establishing a new model of communication, teamwork, critical thinking and professionalism.

The goal of the program is to provide a professionally guided education in software engineering that prepares graduates to have a broad range of career options: industry, government, computing graduate program and professional education.

Software engineering graduates are expected to have:

- be agile software developers with a comprehensive set of skills appropriate to the needs of the dynamic global computing-based society.
- capable of team and organizational leadership in computing project settings, and have a broad understanding of ethical application of computing-based solutions to societal and organizational problems.
- acquire skills and knowledge to advance their career, including continually upgrading professionalism and technical skills.
- have the ability to apply the modern and state-of-art tools and technologies for software engineering practice.
- have the ability to apply a software engineering perspective through software design and construction, requirements analysis, verification and validation to develop solutions to modern problems such as security, data science and system engineering.

Course Structure

Year I/ Semester I	Year I/ Semester II
Basic Engineering Drawing	Algebra and Geometry
Calculus-I	Applied Physics
Computer Workshop	Communication Techniques
Digital Logic	Microprocessor and Computer Architecture
Discrete Structure	Object Oriented Programming in C++
Problem Solving Technique	Web Technology
Programming in C	

Year II/Semester III	Year II/Semester IV
Advance Programming with Java	Analysis and Design of Algorithm
Calculus-II	Computer Graphics & Multimedia
Data Structure & Algorithms	Numerical Methods
Database Management System	Object Oriented Design & Modeling Through UML
Probability & Statistics	Research Fundamentals
Software Engineering Fundamental	System Programming
Year III/Semester V	Year III/Semester VI
Applied Operating Systems	Agile Software Development
Artificial Intelligence & Neural Networks	Cloud Application Development Foundation
Computer Networks	Elective-I
Data Science & Machine Learning	Engineering Management
Simulation & Modeling	Network Programming
Software Design & Architecture	Project-I
	Software Dependability
Year IV/Semester VII	Year IV/Semester VIII
Distributed Systems & Cloud Computing	Elective-III
Elective II	Internship
Engineering Economics	Project-II
Entrepreneurship & Professional Practice	
Software Project Management	
Software Testing, Verification, Validation & Quality Assurance	

B.E. Computer Engineering

Bachelors of Computer Engineering program is a 4-year (8 semesters) 129 credit undergraduate engineering program. The program is concerned with the analysis, design and evaluation of computer systems, both hardware and software. The program emphasizes computer organization and architecture, systems programming, operating systems and digital hardware design. This field of study not only focuses on how computer systems work, but also how they integrate into the larger picture.

The goal of the program is to ensure that the graduates are fundamentally sound, practical,participatory and professional.Specifically, after graduation, the successful graduates are expected to be engaged in successful professional practice in their chosen discipline who can demonstrate personal and professional leadership in their workplace and community. They are also expected to demonstrate effective communication in an engineering environment, and utilize formal and informal learning opportunities to maintain and enhance technical and professional growth.

The Computer Engineering graduates are expected to have:

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

- An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

- An ability to communicate effectively with a range of audiences

- An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

- An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

- An ability to acquire and apply new knowledge as required, using appropriate learning strategies.

Course Structure

Year I/ Semester I	Year I/ Semester II
Basic Electrical Engineering	Algebra & Geometry
Calculus-I	Applied Chemistry
Communication Techniques	Applied Physics
Computer Workshop	Basic Engineering Drawing
Digital Logic	Data Structure & Algorithms
Electronic Devices and Circuits	Instrumentation
Programming in C	Object Oriented Programming in C++
Year II/Semester III	**Year II/Semester IV**
Calculus-II	Advance Programming with Java
Computer Graphics	Applied Mathematics
Data Communication	Computer Architecture
Database Management System	Numerical Methods
Microprocessor & ALP	Research Fundamentals
Operating Systems	Theory of Computation
Year III/Semester V	**Year III/Semester VI**
Artificial Intelligence	Computer Networks
Digital Signal Analysis & Processing	Data Science & Analytics
Embedded System	Elective-I
Engineering Management	Image Processing & Pattern Recognition
Probability & Statistics	Machine Learning
Software Engineering	Project-I
	Simulation & Modeling
Year IV/Semester VII	**Year IV/Semester VIII**
Cloud Computing & Virtualization	Elective-III
Compiler Design	Internsip
Elective-II	Project-II
Engineering Economics	
Entrepreneurship & Professional Practice	
Network & Cyber Security	

Bachelor of Engineering Eligibility and Admission Procedure:

Students who have passed SLC (Class-12) in Science (Physics or Biology group with at least Mathematics of 100 Marks) with minimum of C grade (In aggregate) in Physics, Math, Chemistry or Diploma in Engineering with minimum of 45% Marks. GCE A level: Grade D in each Subject or equivalent degree will be eligible to apply. Applying candidates are selected on merit basis through the entrance examination. Syllabus structure for entrance exam will be based on weightage of Mathematics (40%), Physics (30%), Chemistry (20%) and English (10%).

Academic Programs: Graduate Level

M.Sc. in Information System Engineering

The Master of Science in Information System Engineering (M.Sc. ISE) is a 2 year (4 semesters) 60 credit graduate program under the Faculty of Science and Technology of the Pokhara University. It is aimed at producing professional engineers with the essential skills required to successfully deal with the technical, social, legal and moral aspects of the practices of Information System Engineering in Nepal.

The main objective of this program is to support academia and industry by providing quality andwell-equipped human resources with advanced skills based on knowledge of Information System Engineering. The graduates of the program will understand the concepts related to Information Systems and Knowledge, and have a good skill to apply those concepts in real life application.

Objectives

- Produce high quality competent professionals in the field of Information System Engineering.
- Enhance the analytical skills and problem-solving capability in handling current issues in information and knowledge based engineering.
- Impart the theoretical background that will enable students to apply modern engineering principles to analyze, design, develop, and manage such Information and Knowledge based systems.
- Develop research skills in students and to make them capable of carrying out sound research in Information System Engineering.

Course Structure

Year I/ Semester I	Year I/ Semester II
Information Systems	Enterprise Architecture
Algorithmic Mathematics	Data Warehousing and Data Mining
Web Engineering	Information Retrieval
Communication System Engineering	Operations Research
Knowledge Engineering	Research Methodology
Year II/ Semester III	Year II/ Semester IV
Advance Database	Elective II
Information System Project Management	Thesis
Information Security	
Information System Research Proposal	
Elective I	

Eligibility and Admission Procedure

Students who have passed Bachelors of Engineering degree in Software Engineering/Computer Engineering/ Electronics and Communication/ Information Technology/ Electrical and Electronics Engineering or equivalent with minimum of 2.0 CGPA or equivalent will be eligible to apply.

Applying candidates are selected through the entrance examination conducted by Pokhara University. The admission notice will be published by the Student Admission Committee of Pokhara University, Faculty of Science and Technology during March every year.Applying candidates are selected on merit basis in the entrance examination.

New Admission

GCES will be admitting 111 students (including all scholarships quota) in fresh year in BE (Software and Computer) and MSc ISE.

Level	Program	Seats		
		College Entrance	PU Scholarship	Total
Undergraduate	BE Software	43	5	48
	BE Computer	43	5	48
Graduate	MSc ISE	13	2	15
Total Seats				111

Research Management Committee

Research Management Committee (RMC) institutionalizes various research and capacity building activities for faculties and students. It will head the institute to collaborate with various institutes for organizing research, publication, conferences, workshops, trainings, project activities, etc.

It formulates GCES IT Club for implementation of student activities. It focuses on building R&D specialties and entrepreneurial activities for faculties and students. It provides expertise as well as the resources for all these initiations.

GCES is one of the mature IT institutes of Nepal. We believe in continuous improvement and shall standardize all the procedures for research, project and consulting activities.

GCES hosted 2nd Nepal Winter School in Artificial Intelligence from 10-20 December 2019 organized by NAAMII. GCES IT Club conducted talk on "Girls in Tech" on 2nd August, dedicated to girls of technology, also various workshop in Python Programming, GIT, Hackathon, IEEE (for graduate students), etc.

Resources and Facilities

– Classrooms

Class rooms are spacious, well- ventilated with natural light and adequate electrical facilities. Ergonomically designed furniture,multimedia teaching aids are used in teaching - learning processes. The spirit of classroom training encompasses the fundamentals of theoretical and conceptual learning through interactive sessions of case studies, assignments, quizzes and presentations.

– Laboratories and Workshops

GCES has an excellent IT infrastructure with Computer laboratories, Electronics and microprocessor laboratories, Electrical laboratories, Mechanical Workshop, Physics laboratories.Ithas spacious computer laboratories with specialized proprietary and open source software as per the curriculum.

– ICT Center

GCES has ICT center building with modern facilities in which virtual classes, seminars, video conferences and workshops can be conducted.

– Library

GCES has an excellent and well organized library with textbooks and reference materials including quite a large number of rare technical books provided by our supporters from homeland and abroad. The library subscribes to various national and international journals, daily newspapers and monthly magazines. The state-of-art library includes a computerized library information system and extensive collection of e-books, software tools, etc.

– Transportation Facility

College has a 45 seater bus that goes major routes around Pokhara valley to pick-up and drop the students.

– Health Center

GCES has a health center with medical staff. We provide comprehensive primary care, as well as supportive services.

- Recreation and Sporting Facilities

GCES strongly feels recreation and sports activities are equally essential for students. It has an excellent facility of indoor games like basketball, badminton and table-tennis, and outdoor games like football, volleyball and cricket. Various sporting events are organized by different batches of students every year. Special cultural programs are organized around the year also which provide the students with an opportunity to perform stage programs like- drama, poetry, singing and dancing.

– Industrial Relations

Exposure to real projects in the real working environment is essential for students before they complete their study and apply for jobs.Hence, industrial relations are essential to impart what students are reallyrequired to do. GCES has a very good relationship withthe IT industriesas a result of which students can have access to industrial exposure and experiences. Experts from those companies/industries make regular visitsto the college for the special workshops/training/seminars.

Scholarships

– University (Government) Scholarship

GCES provides scholarships on both undergraduate and graduate levels as per the government rule, and these scholarship students are selected by the Pokhara University.

– GCES Scholarship

GCES provides scholarships to the academically bright and needy students with some financial assistance. These scholarships are awarded to the academically bright, economically disadvantaged, intelligent and self-motivated students, and are reviewed in each semester.

Every year, entrance examination topper students, and semester topper students are awarded with scholarships according to college rules and regulations.

Learning Process

- Regular classroom facilities/Instructions
- Groupwork/Discussions
- Individual & Group Assignment
- Project Work
- Research based experiments
- Virtual Classes
- Visiting Lectures
- Field trip/Field based learning activities
- Internal Terminal Evaluation
- Lab based learning

- Er. Siddhant Pageni
BE SE 2013, Dean List

Studying at GCES and becoming a Software Engineer has been my target since I came to know more about Computer, Software and Games. During college life, I thought that the topics we read were not applicable in real life. All the principles of Software Engineering, all the architectural concepts; they all count! I am currently working as IT Engineer on Daraz,eCommerce. I am responsible to maintain stability of the Daraz platform and take ownership of Daraz First Games: The gaming platform for Daraz.

As a joyfulsoftware engineer, specializing in mobile applications development at Codse, Pokhara, I can tell that you need a solid foundation in data structures, problem-solving and programming techniques.I was fortunate to get my first internship in GCES, as an Android developer, which gave me room for maneuver and was the understructure on which I have built my career.It was a wonderful mix of academia and acquiring self-knowledge that I otherwise would not have obtained.

- Er.Sudha Shrestha
BE SE 2014, Dean List

- Er. Rajesh Timilsina
BESE 2015, Dean List

Before college, I had envisioned college education to be perfect – perfect in every imaginable way. GCES I must concede is not perfect, but it has its own way: guiding students that they can guide themselves on their own. Technology is constantly changing and we as students of technology should be ready and able to embrace – and get along with as well as lead – those changes. I suggest the current students explore as much as possible without bias and *expectation to be spoon-fed.*

The best thing I have learned from GCES is that learning is eternal. The more you learn the more ignorant you become. I was about to explain why but I want to let you experience your failures and success during your study in GCES.

- Er. Sujana Bhandari
BESE 2015, MSc. ISE 2020

Course materials areup-to-date with cutting edge technology. GCES has got facilities, services and laboratories for the research activities which are destined to outstanding outcomes. This completes my in-depth technical knowledge as Software Engineer.

- Er. Sujan Tamrakar
BE SE 2005, MSc. ISE 2018

GCES provides sound academic knowledge and also promotes excellence in learners through inspiration and motivation. It has a strong team dedicated for pulling out the caliber of students. A peaceful environment, friendly professors and adequate research facilities are some of the remarkable features that drive GCES to its excellence. It's my pleasure to be part of GCES and its alumni which put value to my professionalism and a splendid memory for a lifetime.

- Er. Shiva Ram Dam
MSc. ISE 2018

GCES provides an environment for the scientific research. In MSc.ISEprogram, experienced and highly skilled facultiescollaborate to achieve the research objectives. ICT building and other technical resources support our goal. I feel proud of my decision to give valuable time for continuity of my academic career and skill development.

-Er. Sandep Gupta
MSc.ISE 2019

College **Activities**

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