



Kathmandu University  
School of Science and School of Engineering  
Undergraduate Admission 2020/2021

**Kathmandu University Common Admission Test (KUCAT) 2020**

KUCAT-CBT Committee 2020

**Information on  
KUCAT Computer Based Test (KUCAT-CBT) 2020**

**October 2020**

**KATHMANDU UNIVERSITY**  
School of Science and School of Engineering  
Undergraduate Admission 2020  
Kathmandu University Common Admission Test  
**(KUCAT-CBT 2020)**

Kathmandu University calls for application for admission in Undergraduate Programs in School of Science and School of Engineering for the academic year **2020/2021**.

In order to be fully eligible for admission, candidates must have **passed 10+2 level (or equivalent)** with a minimum aggregate GPA of 2.0 (aggregate 50% in percentage scale) and must have appeared in Kathmandu University Common Admission Test (**KUCAT-CBT 2020**) and obtained the required threshold score in the test.

**Candidates who have passed all courses of Grade 11 and have appeared/applied for exams of Grade 12 and are waiting for the results are eligible to apply and will be considered on a provisional basis. However, they must fulfill all eligibility criteria strictly to get permanently admitted.** Candidates are strongly suggested to read the ‘**Application Call 2020**’ and ‘**Procedure for Application and Admission 2020**’ carefully to make sure that he/she is qualified for the application/admission to the specific program.

All candidates seeking admission in the undergraduate programs for intake 2020/2021 of School of Science and School of Engineering shall appear in the KUCAT-CBT 2020 and obtain the score above the minimum threshold required. Candidates are tested for their abilities in either PCM (Physics, Chemistry, and Mathematics) or PCB (Physics, Chemistry, and Biology) depending on the program in which the candidate is seeking admission. Admission is offered in merit basis based on KUCAT score in all the categories described in the call for application.

KUCAT currently is conducted in computer based mode called Computer Based Test (CBT). The Schools replaced Paper Based KUCAT (KUCAT-PBT) with KUCAT-CBT in 2014 as CBT can offer a number of advantages over PBT, such as larger score range, reduction of risk of unfair practice, automatic scoring, and flexibility in conducting tests. The test is conducted only after the call for admission and **ONLY at KU Main Campus, Dhulikhel. The test is not available ONLINE.**

This document describes the KUCAT-CBT 2020 and outlines the syllabus for various subjects. Candidates are strongly recommended to go through this document carefully to get better prepared for the test. For updated information, one should always check KU website <http://www.ku.edu.np> and <http://apply.ku.edu.np/>.

Based on the program the candidate is seeking admission, he/she can choose following test groups in KUCAT-CBT. One should be clear about the choice of the program before selecting the test group.

<b>Program and subject area</b>	<b>Test Group</b>
BE in Electrical and Electronic Engineering (Communication)	PCM (Physics, Chemistry and Mathematics)
BE in Electrical and Electronic Engineering (Power and Control)	
BE in Mechanical Engineering (Automobile)	
BE in Mechanical Engineering (Design and Manufacturing)	
BE in Mechanical Engineering (Energy Technology)	
BE in Mechanical Engineering (Hydropower)	
BE in Civil Engineering (Specialization in Hydropower)	
BE in Chemical Engineering	
B.Tech. in Environmental Engineering	
BE in Computer Engineering	
BE in Geomatics Engineering	
B.Arch in Architecture	
B.Sc. in Computer Science	
B.Sc. in Computational Mathematics	
B.Sc. in Environmental Science	
B.Tech. in Biotechnology	
BSc in Agriculture	PCB

## 1. Overview of KUCAT-CBT

- 1.1 Total duration of each test (KUCAT-CBT) is two hours and has 120 multiple choice questions in total.
- 1.2 The test contains three parts one for each in PCM or PCB. There are 40 multiple choice questions in each part. The questions are distributed uniformly across the topics of the syllabi provided at the end of this document.
- 1.3 For each subject, the syllabus has 40 topics. In actual test, one question will be asked from each topic.
- 1.4 Questions are categorized into one of the five possible difficulty levels from 1 to 5; 1 being the easiest and 5 being the toughest.
- 1.5 Each part of the exam starts with a difficulty level 1 question. If a candidate answers a question of a particular difficulty level correctly, the difficulty level of the subsequent question will be increased by 1. Similarly, if a candidate answers a question of a particular difficulty level incorrectly, the difficulty level of the subsequent question will be decreased by 1. However, answering a difficulty level 5 questions correctly or a difficulty level 1 question incorrectly will not change the difficulty level of the subsequent question.
- 1.6 Initial score of the candidate is zero. Answering a question of difficulty level 1 will add 11 points to the candidate's total score while the score added by higher difficulty level question increases by 2 for each of the higher difficulty level. (For e.g. answering question of difficulty level 5 correctly, adds 19 to the total score).
- 1.7 CBT scores range from 0 to 2220, 0 being the score for attempting all the questions and answering all of them incorrectly and 2220 being the score for answering all the questions correctly.

- 1.8 The candidates are not allowed to skip any questions or go back to the submitted questions but are allowed to switch between the subjects (parts) any time during the test.
- 1.9 The **score of 480** is benchmarked as the minimum threshold (**PASS MARK**) in KUCAT-CBT 2020 for the programs offered by the School of Science while the **score of 528** is benchmarked as the minimum threshold (**PASS MARK**) in KUCAT-CBT 2020 for the programs offered by the School of Engineering. A candidate shall at least obtain this score for being eligible to be offered admission in respective programs.
- 1.10 The candidate will be able to view their KUCAT-CBT scores at the end of their tests.

## 2. Registering for the Test

- 2.1 Opening of the registration is announced with the admission call notice. The registration for KUCAT-CBT 2020 starts on 15 October 2020. The registration closes on 03 November 2020. The application for the test is ONLINE.
- 2.2 Fill the online application form available at <http://apply.ku.edu.np/cbt>. A valid email id is required for online application. Confirmation link and confirmation code will be sent by email. Be sure to click on the confirmation link and enter the confirmation code for online application. Use the login credentials provided to log into the online application system [and complete online admission form](#).
- 2.3 Pay the required application processing fee. Fees can be paid using any method specified in the admission call notice. Refer admission call document for details. Upload the evidence of fee payment through application portal.
- 2.4 Download and print the entrance card after it becomes available in your account.
- 2.5 Wait for the notice to know your test date, time and shift. Notice will be published in university website and the application portal at appropriate time.

## 3 Appearing in the Test

- 3.1 Appear in KUCAT CBT on the date and time notified. Note that KUCAT-CBT is conducted only in KU Main Campus Dhulikhel. It is NOT AVAILABLE ONLINE on the internet. Note the following for appearing in the test:
  - 3.1.1 Arrive at least 15 minutes before the commencement of the examination at the examination room.
  - 3.1.2 Any candidate arriving more than 15 minutes late of his/her test time may not be allowed to sit for the test.
  - 3.1.3 **Do not forget** to bring your color printed admit card and **original** personal identification (the one that was uploaded at the time of filling the application form).
  - 3.1.4 **Any sort of calculators are not allowed.** If necessary, the candidate will have to use calculator available on the desktop of the computer.
  - 3.1.5 Only pens and pencils are allowed in the test room. Other electronic items and writing materials are not permitted inside the examination hall. Mobile phone, wireless devices, or any other portable electronic devices are **strictly prohibited**.
  - 3.1.6 Attempting to cheat in the entrance exam, by any means, or failing to comply with invigilators' instructions may disqualify the candidates from the admission process.
  - 3.1.7 The candidates are advised to wait quietly outside their respective examination halls for invigilator's instruction to enter the examination hall.

- 3.1.8 After verifying the admit cards and photo IDs, the candidates will be provided with the login credentials for CBT. The candidates are required to leave their bags and belongings at the front of the examination halls before taking seats at their respective computer.
  - 3.1.9 The candidates can login to their tests, using the credentials provided, after the invigilator's indication to do so. The candidates shall verify their names on the screen and make sure that they are presented with a list of subjects according to their choice i.e., PCM or PCB.
  - 3.1.10 The candidates can start with one of the three subjects from the list. The exam starts as soon as the candidate clicks on one of the subjects. Time remaining to finish the exam is shown on the screen.
  - 3.1.11 If the candidates face any difficulties or have queries during the test, they can call the invigilators by raising their hands. The candidates are not allowed to communicate with or look at the screens of peer candidates at any point of time during the test.
  - 3.1.12 After completing the test, the candidates are required to view their results, show it to one of the invigilators and log out from the CBT system, before leaving the examination hall.
  - 3.1.13 Note any other rules mentioned in the KUCAT-CBT admission card and comply with the rules.
  - 3.1.14 Failing to comply with the examination rules and attempt of use of any unfair means in the examination will result in disqualification from the admission process.
- 3.2 Considering the current situation caused by COVID-19 pandemic, KUCAT-CBT 2020 will be conducted maintaining physical distance, sanitation hygiene and following health protocols issued by related authorities. All candidates must abide by the accepted protocols. Details of the protocols will be notified at appropriate time through KU website and admission portal.

Note:

- **One candidate can have only one application and will be allowed to appear in KUCAT-CBT only once. If multiple applications are identified from the same applicant (using same or different identification document) or if the candidate appears in KUCAT-CBT exam more than once, his/her exams will be cancelled and he/she will be disqualified for the admission process.**

#### 4 Online Practice Test

- 4.1 In order to get familiar with CBT procedure, take online practice test. Online practice test will be available at: <http://apply.ku.edu.np/opt>  
or  
<http://cbtdemo.ku.edu.np>
- 4.2 The online practice test is intended to make the applicants familiar with the Computer Based Test (CBT) and has two parts with five questions each. The number of questions, topics and difficulty levels do not reflect the actual computer-based entrance test.

## Syllabus for Physics

- A. Mechanics:
  - 1. Physical Quantity
  - 2. Kinematics
  - 3. Dynamics
  - 4. Energy
  - 5. Rotational motion
  - 6. Gravitation
  - 7. Structure and Properties of Matter
  - 8. Elasticity
  - 9. Viscosity
  - 10. Surface tension
- B. Heat & Thermodynamics:
  - 11. Heat and temperature
  - 12. Transmission of heat
  - 13. Basic assumption of kinetic theory of gasses
  - 14. Thermodynamics
- C. Optics:
  - 15. Reflection
  - 16. Refraction
  - 17. Speed of light
  - 18. Dispersion of light
  - 19. Optical Instrument
  - 20. Photometry
- D. Waves:
  - 21. Wave motion
  - 22. Sound
  - 23. Electromagnetic waves
- E. Electrostatics and D. C. Circuits:
  - 24. Simple Electrostatic Phenomenon
  - 25. Charge flow
  - 26. Resistance
  - 27. Effect of Current
  - 28. Capacitors
- F. Magnetic field and Current:
  - 29. Magnetic field
  - 30. Force on conductor
  - 31. Magnetic materials
  - 32. Electromagnetic induction
  - 33. Alternating current
- G. Modern Physics:
  - 34. Electron
  - 35. Photons
  - 36. Electronic
  - 37. Atoms
  - 38. Nucleus
  - 39. Radioactivity
  - 40. Elementary particles

## Syllabus for Chemistry

- A. General & Physical Chemistry:
  - 1. Language of Chemistry
  - 2. Gaseous state of matter
  - 3. Liquid state of matter
  - 4. Solid state of matter
  - 5. Laws of Stoichiometry
  - 6. Avogadro's Hypothesis and its important applications
  - 7. Atomic structure
  - 8. Quantum numbers
  - 9. Chemical bonding
  - 10. Oxidation and Reduction
  - 11. Periodic Table
  - 12. Acids, Bases and Salts
  - 13. Acidimetry and Alkalimetry
  - 14. Electrochemistry
  - 15. Electrode potential
  - 16. Chemical Kinetics
  - 17. Chemical Equilibrium
  - 18. LeChatelier's Principle
  - 19. Chemical Thermodynamics
  - 20. Entropy and spontaneity
- B. Inorganic Chemistry:
  - 21. Hydrogen, Oxygen and Nitrogen
  - 22. Carbon
  - 23. Sulphur and its compound
  - 24. Halogen and halogen acids
  - 25. Introduction to Metals
  - 26. Alkali and alkaline earth metals
  - 27. Coinage metals
  - 28. Heavy metals
- C. Organic Chemistry:
  - 29. Introduction to Organic Chemistry
  - 30. Hydrocarbons
  - 31. Organic halogen compounds
  - 32. Alcohols
  - 33. Ethers
  - 34. Carbonyl Compounds
  - 35. Carboxylic Acids
  - 36. Amines
  - 37. Aromatic Hydrocarbons
  - 38. Aniline and Nitrobenzene
  - 39. Carbohydrates, Proteins, Nucleic Acids, Lipids
  - 40. Polymers, Pesticides, Dyes and Drugs.



## **Syllabus for Mathematics**

- 1 Representation of Data
- 2 Measures of Location and Spread
- 3 Probability
- 4 Permutation and Combination
- 5 Probability Distributions
- 6 Binomial Distributions
- 7 Expectation and Variance of a random variable
- 8 Normal Distribution
- 9 Surds and indices
- 10 Functions and Graphs
- 11 Quadratics and Inequalities
- 12 Differentiation
- 13 Application of Differentiation
- 14 Sequences
- 15 Binomial Theorem
- 16 Trigonometry
- 17 Extending Differentiation
- 18 Vectors
- 19 Geometric Sequences
- 20 Second Derivative
- 21 Integration
- 22 Volume of revolution
- 23 Polynomial
- 24 The Modulus function
- 25 Exponential and Logarithmic function
- 26 Differentiating Exponential and Logarithmic Functions
- 27 Differentiating Trigonometric Function
- 28 Determinants
- 29 Matrices
- 30 Equation of Straight Lines
- 31 A pair of lines
- 32 System of linear equations
- 33 System of Linear Inequalities and Graphs
- 34 Complex Numbers
- 35 Limits and Continuity
- 36 Coordinate Space
- 37 Plane
- 38 Concept of Sets
- 39 Relation
- 40 Functions



## **Syllabus for Biology**

1. Introduction to Biology
2. Cell, cell-division and life components
3. Origin of Life
4. Theory of Evolution by Natural Selection
5. Human Evolution
6. Heredity and variation
7. Regulation of replication, transcription, translation and expression of genetic material
8. Concept of Taxonomy
9. Monera
10. Viruses
11. Protista
12. Mycota
13. Plantae
14. Morphology, Reproduction, Growth and Development of Flowering Plant
15. Photosynthesis
16. Transpiration
17. Animalia
18. Study of Earthworm
19. Study of Frog
20. Animal Tissues
21. Animal Nutrition and Digestive system
22. Respiratory system
23. Circulation of body fluids
24. Excretion and osmoregulation
25. Nervous system
26. Endocrine system
27. Animal reproduction and embryonic development
28. Aminocentesis
29. Growth, Repair, Regeneration, Ageing and Death
30. Animal Behaviour
31. Concept of ecosystem
32. Environmental pollution
33. Green-house effect and global warming
34. Conservation of Natural resources
35. Pesticides
36. Bio-fertilizers and biological pest control
37. Biotechnology
38. Domestication of plants and crop improvements
39. Bioenergy
40. Mental health, addiction and community health