

UNIVERSITY OF CALICUT
THENHIPALAM, CALICUT UNIVERSITY P.O



SYLLABUS

FOR

COMPUTER SCIENCE
(COMPLEMENTARY)
(CHOICE BASED CREDIT AND SEMESTER SYSTEM)

UNDER THE

FACULTY OF SCIENCE

FOR THE STUDENTS ADMITTED FROM THE ACADEMIC
YEAR 2014 – 15 ONWARDS

BOARD OF STUDIES IN COMPUTER SCIENCE (UG)
THENHIPALAM, CALICUT UNIVERSITY P.O
KERALA, 673 635, INDIA

JULY, 2014

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REGULATIONS
FOR
COMPUTER SCIENCE - COMPLEMENTARY
(CHOICE BASED CREDIT AND SEMESTER SYSTEM)

EFFECTIVE FROM THE ACADEMIC YEAR 2014-15

COURSE EVALUATION

Total marks for each complementary course, including lab course, shall be 80 marks.

The evaluation scheme for each course shall contain two parts (1) Internal evaluation (2) external evaluation

16 marks shall be given to the internal evaluation. The remaining 64 marks shall be for the external evaluation.

INTERNAL EVALUATION

16 marks in each course, including lab, are for internal examinations.

The internal assessment shall be based on a predetermined transparent system involving written test, assignments, seminars and attendance in respect of theory courses and on test/record/viva/attendance in respect of lab courses.

Components with percentage of marks of Internal Evaluation of Theory Courses are:

Test paper – 8 Marks

Attendance – 4 Marks

Assignment/Seminar/Viva – 4 Marks

Components with percentage of marks of Internal Evaluation of Lab Courses are:

Test paper – 8 Marks

Attendance – 4 Marks

Assignment/Lab involvement – 4 Marks

Attendance of each course will be evaluated as below:

Above 90% attendance – 4 Marks

85 to 89% – 3 Marks

80 to 84% – 2 Marks

76 to 79 % – 1.5 Marks

75% – 1 Marks

(If a fraction appears in the final internal marks awarded, nearest whole number is to be taken)

To ensure transparency of the evaluation process, the internal assessment marks awarded to the students in each course in a semester shall be notified on the notice board at least one week before the commencement of external examination. There shall not be any chance for improvement for internal marks. The course teacher(s) shall maintain the academic record of each student registered for the course, which shall be forwarded to the University by the college Principal after obtaining the signature of both course teacher and HOD.

The marks secured for internal examination only need be sent to university, by the colleges concerned.

EXTERNAL EVALUATION:

There shall be University examinations for each course at the end of each semester.

Practical examinations shall be conducted by the University at the end of fourth semester.

External evaluation carries 64 Marks, for each course.

External evaluation of even (2 and 4) semesters will be conducted in centralized valuation camps immediately after the examination. Answer scripts of odd semester (1 and 3) examination will be evaluated by home valuation. All question papers shall be set by the university.

The model of the question paper for external examination (theory courses) of 3 Hrs duration shall be:

1. **Section A:** 9 compulsory objective type questions (MCQ/fill in the blank/ matching/one word/etc) of 1 mark each (**Total 9 Marks**)
2. **Section B:** 5 compulsory short answer type questions of 2 Marks each (either a single question or can have subdivisions) (**Total 10 Marks**)
3. **Section C:** 5 short essay type questions of 5 Marks each, to be attempted from a set of 8 questions – at least one question from each unit (either a single question or can have subdivisions) (**Total 25 Marks**)
4. **Section D:** 2 long essay type questions of 10 Marks each, to be attempted from a set of 3 questions (either a single question or can have subdivisions) (**Total 20 Marks**)

The external examination in theory courses is to be conducted with question papers set by external experts. The evaluation of the answer scripts shall be done by examiners based on a well-defined scheme of valuation and answer keys shall be provided by the University.

The external examination in practical courses shall be conducted by two examiners, one internal and an external, appointed by the University.

The model of the question paper for external examination (lab courses) of 3 Hrs duration shall be:

1. **Section A:** One marked question of 25 Marks from Programming Lab Part A (C Programming) is to be attempted (Design - Algorithm/Flowchart/Interface: 5 Marks, Code: 10 Marks and Result: 10 Marks. **Total 25 Marks**)
2. **Section B:** One marked question of 25 Marks from Programming Lab Part B (VB.NET Programming) is to be attempted (Design - Algorithm/Flowchart/Interface: 5 Marks, Code: 10 Marks and Result: 10 Marks. **Total 25 Marks**)
3. **Section C:** Lab viva voce (**Total 10 Marks**)

4. **Section D:** Lab Record (**Total 4 Marks**)

REVALUATION:

In the new system of grading, revaluation is permissible. The prevailing rules for revaluation are applicable.

Students can apply for photocopies of answer scripts of external examinations. Applications for photocopies/scrutiny/revaluation should be submitted within 10 days of publication of results. The fee for this shall be as decided by the university.

IMPROVEMENT COURSE

A maximum of two courses (Common, Core, Complementary or Open) can be improved in each semester. Improvement of a particular semester can be done only once. The student shall avail the improvement chance in the succeeding year after the successful completion of the semester concerned. The internal marks already obtained will be carried forward to determine the grades/marks in the improvement examination. If the candidate fails to appear for the improvement examination after registration, or if there is no change in the results of the improvement examination appeared, the marks/grades obtained in the first appearance will be retained.

Improvement and supplementary examinations cannot be done simultaneously.

EVALUATION AND GRADING

Mark system is followed instead of direct grading for each question (for both internal and external examinations). For each course in the semester letter grade, grade point and % of marks are introduced in 7- point indirect grading system. The grading on the basis of a total internal and external mark will be indicated for each course and for each semester and for the entire programme.

Indirect Grading System in 7 point scale is as below:

% of Marks	Grade	Interpretation	Grade Point (G)	Range of Grade Points	Class
90 and above	A+	Outstanding	6	5.5 to 6	First class with
80 to below 90	A	Excellent	5	4.5 to 5.49	

					distinction
70 to below 80	B	Very Good	4	3.5 to 4.49	First class
60 to below 70	C	Good	3	2.5 to 3.49	
50 to below 60	D	Satisfactory	2	1.5 to 2.49	Second class
40 to below 50	E	Pass/Adequate	1	0.5 to 1.49	Pass
Below 40	F	Failure	0	0 to 0.49	Fail

An aggregate of E grade with 40% marks (after external and internal put together) is required in each course for a pass and also for awarding a degree.

Appearance for Internal Assessment (IA) and End Semester Evaluation (ESE-external) are compulsory and no grade shall be awarded to a candidate if she/he is absent for IA/ESE or both. For a pass in each course 40% marks or E grade is necessary

A student who fails to secure a minimum grade for a pass in a course is permitted to write the examination along with the next batch.

After the successful completion of a semester, Semester Grade Point Average (SGPA) of a student in that semester is calculated using the formula given below. For the successful completion of a semester, a student should pass all courses. However, a student is permitted to move to the next semester irrespective of SGPA obtained.

The Semester Grade Point Average can be calculated as

$$SGPA = \frac{\text{Sum of the credit points of all courses in a semester}}{\text{Total Credits in that semester}}$$

$$i.e., \quad SGPA = \frac{C1 \times G1 + C2 \times G2 + C3 \times G3 + \dots}{n}$$

where $G1, G2, \dots$ are grade points of different courses; $C1, C2, \dots$ are credits of different courses of the same semester and n is the total credits in that semester.

The Cumulative Grade Point Average (CGPA) of the student is calculated at the end of a programme. The CGPA of a student determines the overall academic level of the student in a programme and is the criterion for ranking the students. CGPA can be calculated by the following formula

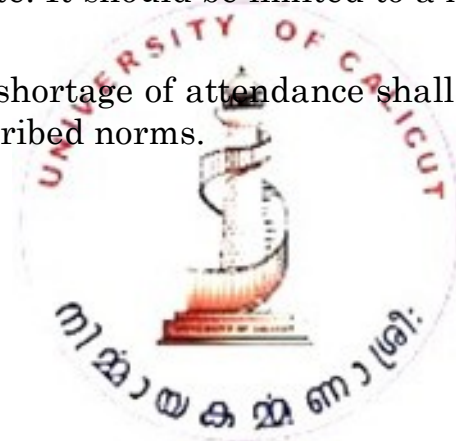
The Cumulative Grade Point Average (CGPA) can be calculated as:

$$CGPA = \frac{\text{Total credit points obtained in six semesters}}{\text{Total Credits}}$$

ATTENDANCE

A student shall be permitted to appear for the semester examination, only if he/she secures not less than 75% attendance in each semester. Attendance shall be maintained by the concerned Department. Condonation of shortage of attendance to a maximum of 9 days in a semester subject to a maximum of two times during the whole period of the degree programme may be granted by the University. Benefits of attendance may be granted to students who attend the approved activities of college/university with prior concurrence of the Head of the institution. Participation in such activities may be treated as presence in lieu of their absence on production of participation/attendance certificate. It should be limited to a maximum of 9 days in a semester.

The condonation of shortage of attendance shall be granted according to the existing prescribed norms.



**CURRICULUM FOR B.SC COMPUTER SCIENCE
(COMPLEMENTARY)
(2014 – 15 ACADEMIC YEAR ONWARDS – AS PER THE
CUCBCSSUG 2014 REGULATIONS)**

Total Courses: 5

Total Credits: 12

Semester	Course No	Course Code	Course Title	Marks			Contact Hours			Credits
				Internal	External	Total	Theory	Lab	Total	
I	1	CSC1C01	Computer Fundamentals	16	64	80	2	2	4	3
II	2	CSC2C02	Programming in C	16	64	80	2	2	4	2
III	3	CSC3C03	Fundamentals of System Software, Networks & DBMS	16	64	80	3	2	5	3
IV	4	CSC4C04	Visual Programming	16	64	80	3	0	3	2
IV	5	CSC4C05	Programming Lab: C & Visual Programming	16	64	80	0	2	2	2
Total (5 Courses)						400				12

CSC1B01 – Computer Fundamentals

Semester: 1

Course Number: 1

Contact Hours: 2T+2L

Number of Credits: 2

Number of Contact Hours: 30T+30L

Course Evaluation: Internal – 15 Marks + External – 65 Marks

Aim of the Course: To impart the students with fundamental principles and operations of various units of computer and to impart them with the basic skill in application packages.

Objectives of the Course:

- ✚ To learn the basics of computer hardware units and how they work together
- ✚ To acquire basic skill with office packages

Prerequisites: Background of the basic science at +2 level

Course Outline

UNIT I (6T+6L)

Number systems- Non-positional number systems and positional number systems (Binary, Octal and Hexadecimal), Converting from one number system to another- decimal to a new base, converting to decimal from another bases, converting from base other than ten to base other than ten, short cut method for converting from binary to octal, octal to binary, binary to hexadecimal and hexadecimal to binary, Computer Codes (BCD, EBCDIC, ASCII) error detecting and correcting codes, parity bit, Hamming Code, computer arithmetic ,importance of binary, binary addition and subtraction.

UNIT II (6T+6L)

Boolean Algebra and Logic circuits- fundamental concepts of Boolean Algebra, postulates, Principle of duality, theorems of Boolean Algebra, Boolean functions, minimization, complement, canonicals forms, conversion between canonical forms. Logic Gates- AND, OR, NOT, NAND, NOR, XOR and XNOR, logic circuits, converting expression to logic circuit, universal NAND and NOR gates, Exclusive OR and equivalence functions, Design of Combinational circuits (Half Adder, Subtractor and Full Adder)

UNIT III (6T+6L)

Basic Computer Organization-Input Unit, Output Unit, Storage Unit (Direct, Sequential and Random Access), CPU organization, Control Unit (micro programmed and hardwired control), primary storage, memory hierarchy, storage locations and addresses, storage capacity, bit, byte, nibble, RAM, ROM, PROM and EPROM, cache memory,

registers. Secondary storage devices (Magnetic tape, Hard disk and CD drive)

UNIT IV (6T+6L)

I/O devices - Input Devices-identification and its use, keyboard, pointing devices (mouse, touch pad and track ball), Video digitizer, remote control, joystick, magnetic stripes, scanner, digital camera, microphone, sensor, and MIDI instruments, Output Devices-identification and its use, monitor, printer (laser, inkjet, dot-matrix), plotter, speaker, control devices (lights, buzzers, robotic arms, and motors)

UNIT V (6T+6L)

Planning a Computer program, purpose of program planning, algorithm, flowchart - symbols, sample flowcharts, advantages and limitations

References:

1. *Computer Fundamentals*, Pradeep K. Sinha and Priti Sinha, BPB
2. *Introduction to Computer*, Peter Nortorn, TMH
3. *Fundamental of Computers*, Rajaraman, V., Prentice Hall India
4. *Computer Fundamentals*, B. Ram

Lab List

Word Processing

- ✚ Paragraph formatting
- ✚ Newspaper style Document
- ✚ Table creation
- ✚ Mail merge
- ✚ Page formatting & printing

Spreadsheet

- ✚ Worksheet entries, including formulas
- ✚ Formatting cells
- ✚ Chart creation

✚ Functions

Presentation Software

✚ Creating presentation

✚ Animations

✚ Sound

✚ Inserting picture

CSC2C02 – Programming in C

Semester: 2

Course Number: 2

Contact Hours: 2T+2L

Number of Credits: 2

Number of Contact Hours: 30T+30L

Course Evaluation: Internal – 15 Marks + External – 65 Marks

Aim of the Course: To equip the students with the basic concepts of problem solving using computers.

Objectives of the Course:

✚ To learn the concepts of programming.

✚ To learn the C language

Prerequisites: Background of the basic science at +2 level

Course Outline

UNIT I (6T+6L)

Introduction to C- Structure of C program, Character Set, Keywords, Identifiers, Data Types, Qualifiers, Variables, Declarations, Symbolic Constants, Expressions, Statements, Different Types of Operators (Arithmetic, Logical, Relational & Equality, Unary and Conditional), Operator Precedence and Associativity, Library Functions, Comments, I/O functions-(Formatted scanf() & printf(), getchar (),

putchar (), getche(), gets(), puts())

UNIT II (6T+6L)

Control Statements- Selection Statements (if, if-else, else if ladder, switch), iteration (while, do while, for), jumping (goto, break, continue), Nested Control Statements

UNIT III (6T+6L)

Structured Data types - Arrays (One dimensional and Two Dimensional), Character and String Functions, Structure (Definition, Processing-period Operator), Union

UNIT IV (6T+6L)

User defined Functions - Advantages, Definition, Accessing functions, formal and Actual Parameters, Recursion, Storage Classes- Automatic, External, Static and Register Variable, Argument Passing Mechanism

UNIT V (6T+6L)

Pointers and data files- Pointers, advantages, declaration, operations on pointers, pointers and one dimensional arrays, dynamic memory allocation. Data files (sequential), file handling functions (fopen(), fclose(), fputc(), fgetc(), fgets(), fputs(), fscanf(), fprintf())

References:

1. *Programming in Ansi C*, E Balagurusamy, Tata McGraw Hill
2. *Programming with C*, Byran Gotfried, Schaum Series
3. *Programming in C*, Kezningham & Ritchie
4. *Let us C*, Yashvant Kanetkar, BPB publications
5. *The spirit of C*, Mullish Cooper, Jasco books
6. *The Complete reference C*, Herbert Schildt, Tata Mc Graw Hill

C Programming Lab List

- ✚ Programs involving different data types
- ✚ Programs involving different arrays

- ✚ Programs involving different control structures and nested control structures
- ✚ Programs involving functions
- ✚ Programs involving recursion
- ✚ Programs involving different storage classes
- ✚ Programs involving strings
- ✚ Programs involving structure and union
- ✚ Programs involving files

CSC3C03 – Fundamentals of System Software, Networks & DBMS

Semester: 3

Course Number: 3

Contact Hours: 3T+2L

Number of Credits: 3

Number of Contact Hours: 45T+30L

Course Evaluation: Internal – 15 Marks + External – 65 Marks

Aim of the Course: To impart the students with the basic concepts of system software, Computer Networks and Database.

Objectives of the Course:

- ✚ To learn the basic concepts of various system software
- ✚ To learn the basics of Computer Networks
- ✚ To learn the basics of Databases

Prerequisites: Background of the basic science at +2 level

Course Outline

UNIT I (9T+6L)

System software - classification of programming languages (Machine, assembly & High level), Characteristics and Comparison, language

processors (Assembler, Interpreter and Compiler), Operating Systems- Functions, types of OS (batch, multiprogramming, time sharing, real time and distributed)

UNIT II (9T+6L)

Computer networks- goals of networking, network topologies, types of networks (LAN, MAN and WAN), network model, OSI model- 7 layers, Internet Layer- 5 layers, Communication Media-Guided (Twisted Pair, Coaxial Cable and Fiber Optic) and Unguided (microwave, satellite)

UNIT III (9T+6L)

Database Management Systems-definition, structure of Database, data models (Record based Data model, Network model: - Basic Components, Record types, data types, links, relationships, Hierarchical model and Relational model)

UNIT IV (9T+6L)

Structured query language - Create, insert, select, update, delete, alter, drop commands

UNIT V (9T+6L)

HTML-hypertext, hyper media, understanding basic HTML tools-HTML editor, web browser, General structure of HTML document, different types of elements-doc type, comment element, structural element, HTML tags and attributes: <html>, <body>, <head>, <title>, <h1>,... ,<h6>,
, <table>, , <hr>, adding links, background image to the body, creating lists.

References:

1. *Fundamentals of Computers*, P. K Sinha
2. *Operating System: A concept based Approach*, D. M Dhamdhare
3. *Data Communication & Networking*, Behrouz A Forouzan, MC Graw Hill
4. *Principles of Web Page Design*, Joel Sklar, Vikas Publications

Lab List

HTML

- ✚ Simple HTML document creation
- ✚ HTML document with tables
- ✚ HTML document with various lists
- ✚ HTML document with links to different parts of the same documents and to separate documents

MySQL

- ✚ Table creation
- ✚ Data insertion and deletion
- ✚ Data retrieval
- ✚ Alteration of tables

CSC4C04 – Visual Programming

Semester: 4

Course Number: 4

Contact Hours: 3T

Number of Credits: 3

Number of Contact Hours: 45T

Course Evaluation: Internal – 15 Marks + External – 65 Marks

Aim of the Course: To impart the students with the basic principles of visual programming.

Objectives of the Course:

- ✚ To learn the basic concepts of .NET framework
- ✚ To learn the basics of visual programming using VB.NET

Prerequisites: Basic programming skills

Course Outline

UNIT I (9T)

Introduction to visual Programming -Concept of event driven programming, introduction to VB.Net, The .Net Framework and Common language runtime, Building VB.Net Application, VB IDE, forms, properties, events, VB language-console application and windows application, data type, declaring variable, scope of variable, operators and statements

UNIT II (9T)

Control Statements- if-then, if -then- else, else-if ladder, select case, choose, loop statements- do loops, for, while-The with statement, converting between data types, Handling dates and times, Arrays - declaration and manipulation, Strings and String functions, procedures and functions

UNIT III (9T)

Windows Applications-forms, adding controls to forms, handling events, MsgBox, Input Box, multiple forms, handling mouse and Keyboard events, object oriented programming- creating and using classes and objects, Handling Exceptions- on Error Goto

UNIT IV (9T)

Common controls - textbox, Rich textbox, label, command Button, option button, checkbox, frame, list box, combo box, scrollbar, picture box, image box, timer, Data control, OLE, file controls-properties and methods

UNIT V (9T)

Data Access with ADO.Net, accessing data with Server Explorer, Accessing Data with data Adaptors and Data sets, Creating a new data connection, creating and populating Data set, displaying data in Data Grid, selecting a data provider, Data accessing using Data adapter Control, Binding Data to Controls

References:

1. *Visual Basic.NET Black Book*, Steven Holzner
2. *Visual Basic.NET for Developer*, Keith Franklin, Rebecca Riordan, SAMS.

3. *Learning Visual Basic.Net*, Jesse Liberty
4. *Visual Basic.Net Programming in Easy Steps*, Tim Anderson, Dreamtech Press

VB.NET Programming Lab List

- ✚ Simple VB.NET console applications
- ✚ Simple VB.NET Windows applications
- ✚ Programs involving different control structures
- ✚ Programs involving various array operations
- ✚ Programs involving various string functions
- ✚ Programs involving forms and multiple forms
- ✚ Programs involving mouse and keyboard events
- ✚ Programs involving MsgBox, InputBox
- ✚ Programs involving classes and objects
- ✚ Programs involving exception handling
- ✚ Programs involving common controls
- ✚ Programs involving file controls
- ✚ Programs involving OLE
- ✚ Programs involving data access using ADO.NET

CSC4C05 – Programming Lab: C & Visual Programming

Semester: 4

Course Number: 5

Contact Hours: 2L

Number of Credits: 2

Number of Contact Hours: 30L

Course Evaluation: Internal – 15 Marks + External – 65 Marks

Aim of the Course: To provide practical skill in Programming

Objectives of the Course:

- ✚ To develop C Programming skills
- ✚ To develop VB.NET programming skills
- ✚ To develop Database handling skills
- ✚ To develop skills in using office software

Prerequisites: Background of the basic computing knowledge

Course Outline

LAB LIST

Word Processing

- ✚ Paragraph formatting
- ✚ Newspaper style Document
- ✚ Table creation
- ✚ Mail merge
- ✚ Page formatting & printing

Spreadsheet

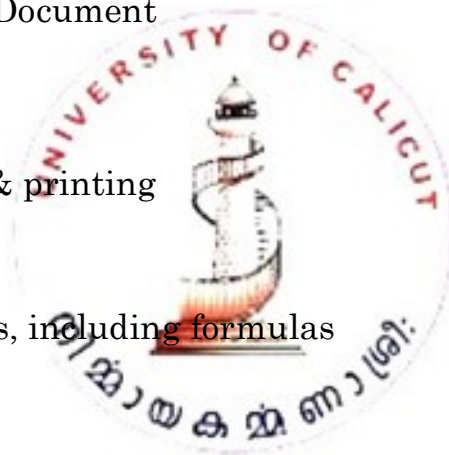
- ✚ Worksheet entries, including formulas
- ✚ Formatting cells
- ✚ Chart creation
- ✚ Functions

Presentation Software

- ✚ Creating presentation
- ✚ Animations
- ✚ Sound
- ✚ Inserting picture

C Programming

- ✚ Programs involving different data types
- ✚ Programs involving different arrays
- ✚ Programs involving different control structures and nested control



structures

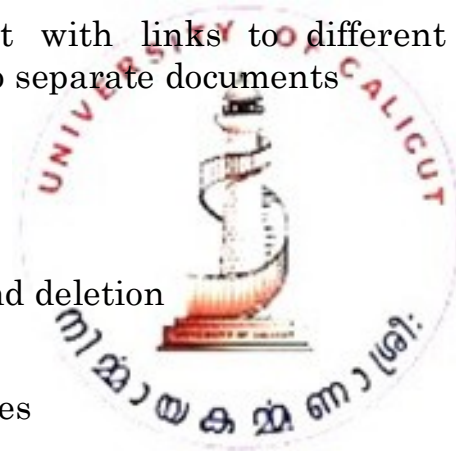
- ✚ Programs involving functions
- ✚ Programs involving recursion
- ✚ Programs involving different storage classes
- ✚ Programs involving strings
- ✚ Programs involving structure and union
- ✚ Programs involving files

HTML

- ✚ Simple HTML document creation
- ✚ HTML document with tables
- ✚ HTML document with various lists
- ✚ HTML document with links to different parts of the same documents and to separate documents

MySQL

- ✚ Table creation
- ✚ Data insertion and deletion
- ✚ Data retrieval
- ✚ Alteration of tables



VB.NET Programming

- ✚ Simple VB.NET console applications
- ✚ Simple VB.NET Windows applications
- ✚ Programs involving different control structures
- ✚ Programs involving various array operations
- ✚ Programs involving various string functions
- ✚ Programs involving forms and multiple forms
- ✚ Programs involving mouse and keyboard events
- ✚ Programs involving MsgBox, InputBox
- ✚ Programs involving classes and objects

- ✚ Programs involving exception handling
- ✚ Programs involving common controls
- ✚ Programs involving OLE
- ✚ Programs involving data access using ADO.NET

All lab works should be neatly recorded in a Laboratory Record Book in written form. However Program results can be pasted in the left hand side of the fare record. The laboratory record should have a minimum of:

- ✚ 20 lab exercises from C Programming
- ✚ 15 lab exercises from VB.NET Programming
- ✚ 3 exercises each from Word processing, Spreadsheet, Presentation Software, Web page design & Database

All students should maintain a rough record (observation note book) too, in which they write all the works to be carried out in the lab prior to his/her entry into the lab. He/She may also note down the i/p and o/p for program verification in the rough record.

