



Faculty of Computers & Artificial Intelligence  
2<sup>nd</sup> Term (2019-2020) Final Exam  
Information Security and Digital Forensics Program  
Course Code: NCS142      Level: 1<sup>st</sup> level  
Course name: Object Oriented Programming



Benha University  
Final Date: 7 / 6 /2020  
Total Marks: Pass / Fail  
Examiner(s): Dr. Ahmed Taha

**Research submission: From 31 May to 7 June 2020**

---

**Based on your study in the Object-Oriented Programming (OOP) course,**

- **A research project is required for each student separately. No student is allowed to participate in the research within a group of students.**
- **The project must cover the major aspects of OOP design including abstraction, encapsulation, inheritance, polymorphism, function overloading, function overriding, and should be implementable in C++.**
- **Student must plan and implement a multiple-class, fully functioning application in C++.**
- **Successful projects will have a clear inheritance hierarchy, and demonstrate concepts learned during the course.**
- **The project will be evaluated on how it fulfills the requirements and the quality / completion of the code.**
- **A project must represent the student's sole effort; online tutorials or other examples may be consulted, but they must be improved upon and noted in the final documentation. Failure to note and provide links to reference material will be considered cheating.**
- **Academic dishonesty of any kind will not be tolerated**

**Notes: please, your research must contain the following elements:**

- 1. Project idea**
- 2. A diagram for the classes involved and the attributes of each class**

**3. Project implementation identifying the concepts that each code segment implements as a comment**

**For example:**

```
//Inheritance
class A: public class B
{
    ...
}
```

**4. Conclusion**

**GOOD LUCK,**

**Examiner(s)**  
**Dr. Ahmed Taha**

**Program Coordinator**  
**Dr. Mohamed Taha**