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| **Class title** | Computer II<br>(전자계산2) | **Credit** | 2 |

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| **Level** | Undergraduate students in science or engineering majors |
| **Objectives** | Understanding recent standards (Fortran 2008) of Fortran programming language (including C-interoperability and parallelism) for scientific and engineering computations |
| **Pre-requisites** | None, but basic-level knowledge of operating system, computing system and hardware may help (e.g., Windows operating system, cpu, thread, stack, heap). |
| **References** | R1: Modern Fortran explained: Incorporating Fortran 2018, 5th edition, Oxford University Press, by M. Metchalf, J. Reid, and M. Cohen |
| **Tools** | GNU fortran (gfortran), GNU C (gcc), GNU debugger (gdb) on Windows system |

| Week | Contents |
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| 1 | Background, comparison with the other compiled and script languages, GNU compilers and debugger, Fortran source form, data type |
| 2 | Floating point arithmetic, exception handling |
| 3 | Assignments: Scalar, character, array |
| 4 | Assignments: Derived data type, pointer |
| 5 | Control constructs: If, case, where, continue, exit |
| 6 | Control constructs: Do, while |
| 7 | File: (Un)formatted, namelist, Fortran binary, system independent binary with meta data |
| 8 | Mid-term exam |
| 9 | Program units: Main, subroutines, functions |
| 10 | Module, module procedure, scoping rules, array features |
| 11 | Module, explicit interface, generic procedure, array features |
| 12 | Explicit interface, generic procedure, external libraries, array features |
| 13 | Object-oriented programming |
| 14 | C-Interoperability, calling C libraries |
| 15 | Coarray, parallelism, thread safety |
| 16 | Final exam |