# COE ABET COMMITTEE

## CURRICULUM CHANGES DURING

## THE ACCREDITATION PERIOD

Term T112

### COMPUTER ENGINEERING

**Program**

at

## King Fahd University of Petroleum & Minerals
### DHAHRAN, SAUDI ARABIA

**February 2012**

**ACKNOWLEDGEMENT**

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# New BSc. Program in Computer Engineering Meets ABET Minimum Requirments

To cope with local and international challenges in the discipline, the Computer Engineering Department developed a new BSc Program in computer Engineering. The new COE program implements an education in science, mathematics, engineering science, engineering design and general studies that meets or exceeds the expectations of the ABET criteria. The minimum total number of credits for a B.Sc. in Computer Engineering with COOP is 133 while it is 132 for a B.Sc. in Computer Engineering without COOP:

1. The requirements for a Bachelor of Science degree in Computer Engineering With No Coop Option are summarized below:

| TOTALS-ABET BASIC-LEVEL REQUIREMENTS | | 32 | 53 | 12 | 35 |
|---|---|---|---|---|---|
| OVERALL TOTAL CREDIT HOURS FOR THE DEGREE (**With No Coop**) | 132 | | | | |
| PERCENT OF TOTAL | | 24 | *40* | *9* | *27* |
| Total must satisfy either credit hours or percentage | Minimum Semester Credit Hours | 32 Hours | 48 Hours | | |
| | Minimum Percentage | 25% | 37.5 % | | |

2. The requirements for a Bachelor of Science degree in Computer Engineering With Coop Option are summarized below:

| TOTALS-ABET BASIC-LEVEL REQUIREMENTS | | 32 | *50* | *18* | *33* |
|---|---|---|---|---|---|
| OVERALL TOTAL CREDIT HOURS FOR THE DEGREE (**With Coop**) | 133 | | | | |
| PERCENT OF TOTAL | | 24 | *38* | *14* | *25* |
| Total must satisfy either credit hours or percentage | Minimum Semester Credit Hours | 32 Hours | 48 Hours | | |
| | Minimum Percentage | 25% | 37.5 % | | |

**It is clear that the BSc Degree Program in Computer Engineering with either of the options "With No Coop" or "With Coop" satisfies ABET Minimum requirements.**

The detailed (Semester based) program requirements for a Bachelor of Science degree in Computer Engineering are summarized below in Table 1 (With No Coop Option) and Table 2 (With Coop Option). The ABET Credits Hour Distribution over the Curricular Areas of each of the above options are shown in Tables 3 and 4, respectively.

## Table 1 – Computer Engineering Curriculum (No Coop Option)

| COURSE | | TITLE | LT | LB | CR | COURSE | | TITLE | LT | LB | CR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Preparatory Year** | | | | | | | | | | | |
| ENGL | 001 | Prep. English I | 15 | 5 | 8 | ENGL | 002 | Prep. English II | 15 | 5 | 8 |
| MATH | 001 | Prep. Math I | 3 | 1 | 4 | MATH | 002 | Prep. Math II | 3 | 1 | 4 |
| PYP | 001 | Prep. Physical Science | 2 | 0 | 2 | PYP | 002 | Prep. Computer Science | 0 | 2 | 1 |
| PYP | 003 | University Study Skills | 0 | 2 | 1 | ME | 003 | Prep. Eng. Technology | 0 | 2 | 1 |
| PE | 001 | Prep. Health and Physical Educ. I | 0 | 2 | 1 | PE | 002 | Prep. Health and Physical Educ. II | 0 | 2 | 1 |
| | | | **20** | **10** | **16** | | | | **18** | **12** | **15** |
| **Total credit hours required in Preparatory Program:** | | | | | | | | | | | |
| **First Year (Freshman)** | | | | | | | | | | | |
| MATH | 101 | Calculus I | 4 | 0 | 4 | MATH | 102 | Calculus II | 4 | 0 | 4 |
| PHYS | 101 | General Physics I | 3 | 3 | 4 | PHYS | 102 | General Physics II | 3 | 3 | 4 |
| ENGL | 101 | An Intro to Academic Discourse | 3 | 0 | 3 | ENGL | 102 | Intro to Report Writing | 3 | 0 | 3 |
| CHEM | 101 | General Chemistry I | 3 | 4 | 4 | ICS | 102 | Intro. To Computing I | 2 | 3 | 3 |
| IAS | 111 | Belief & its Consequences | 2 | 0 | 2 | IAS | 101 | Practical Grammar | 2 | 0 | 2 |
| PE | 101 | Physical Education I | 0 | 2 | 1 | PE | 102 | Physical Education II | 0 | 2 | 1 |
| | | | **15** | **9** | **18** | | | | **14** | **8** | **17** |
| **Second Year (Sophomore)** | | | | | | | | | | | |
| COE | 202 | Digital Logic Design | 3 | 0 | 3 | ICS | 202 | Data Structures | 3 | 3 | 4 |
| COE | 203 | Digital Logic Design Lab | 0 | 3 | 1 | EE | 203 | Electronics I | 3 | 3 | 4 |
| ICS | 201 | Intro. To Computing II | 3 | 3 | 4 | IAS | 212 | Professional Ethics | 2 | 0 | 2 |
| EE | 201 | Electric Circuits I | 3 | 3 | 4 | COE | 241 | Data & Computer Communications | 3 | 0 | 3 |
| MATH | 201 | Calculus III | 3 | 0 | 3 | STAT | 319 | Prob.& Stat. for Engineers | 3 | 0 | 3 |
| IAS | 201 | Objective Writing | 2 | 0 | 2 | | | | | | |
| | | | **14** | **9** | **17** | | | | **14** | **6** | **16** |
| **Third Year (Junior)** | | | | | | | | | | | |
| MATH | 260 | Differential Eqs. & Lin. Algebra | 3 | 0 | 3 | COE | 306 | Introduction to Embedded Systems | 3 | 3 | 4 |
| ICS | 253 | Discrete Structures I | 3 | 0 | 3 | IAS | 301 | Language Comm. Skills | 2 | 0 | 2 |
| ENGL | 214 | Academic & Professional Comm. | 3 | 0 | 3 | D.E. | | COE 444 or COE 405 | 3 | 0 | 3 |
| COE | 301 | Computer Organization | 3 | 3 | 4 | T.E. | | Technical Elective 1 | 3 | 0 | 3 |
| COE | 344 | Computer Networks | 3 | 3 | 4 | COE | 300 | Principles of Comp. Eng. Design | 1 | 3 | 2 |
| | | | | | | SE | 307 | Eng. Economy Analysis | 3 | 0 | 3 |
| | | | **15** | **6** | **17** | | | | **15** | **6** | **17** |
| | | **Summer Session** | | | | COE | 399 | Summer Training | **0** | **0** | **0** |
| **Fourth Year (Senior)** | | | | | | | | | | | |
| ICS | 431 | Operating Systems | 3 | 3 | 4 | COE | 485 | Senior Design Project | 1 | 6 | 3 |
| COE | 4xx | COE Elective 1 | 3 | 0 | 3 | IAS | 322 | Human Rights in Islam2 | 2 | 0 | 2 |

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| COURSE | | TITLE | LT | LB | CR | COURSE | | TITLE | LT | LB | CR |
|--------|---|-------|----|----|----|--------|---|-------|----|----|----|
| COE | 4xx | COE Elective 2 | 3 | 0 | 3 | COE | 4xx | COE Elective 3 | 3 | 0 | 3 |
| T.E. | | Technical Elective 2 | 3 | 0 | 3 | COE | 4xx | COE Elective 4 | 3 | 0 | 3 |
| GS | xxx | GS Elective 1 | 3 | 0 | 3 | GS | xxx | GS Elective 2 | 3 | 0 | 3 |
| | | | 15 | 3 | 16 | | | | 12 | 6 | 14 |
| **Total credit hours required in Degree Program : 132** | | | | | | | | | | | |

## Table 2 – Computer Engineering Curriculum (With Coop Option)

| COURSE | | TITLE | LT | LB | CR | COURSE | | TITLE | LT | LB | CR |
|--------|---|-------|----|----|----|--------|---|-------|----|----|----|
| **Preparatory Year** | | | | | | | | | | | |
| ENGL | 001 | Prep. English I | 15 | 5 | 8 | ENGL | 002 | Prep. English II | 15 | 5 | 8 |
| MATH | 001 | Prep. Math I | 3 | 1 | 4 | MATH | 002 | Prep. Math II | 3 | 1 | 4 |
| PYP | 001 | Prep. Physical Science | 2 | 0 | 2 | PYP | 002 | Prep. Computer Science | 0 | 2 | 1 |
| PYP | 003 | University Study Skills | 0 | 2 | 1 | ME | 003 | Prep. Eng. Technology | 0 | 2 | 1 |
| PE | 001 | Prep. Health and Physical Educ. I | 0 | 2 | 1 | PE | 002 | Prep. Health and Physical Educ. II | 0 | 2 | 1 |
| | | | 20 | 10 | 16 | | | | 18 | 12 | 15 |
| **Total credit hours required in Preparatory Program:** | | | | | | | | | | | |
| **First Year (Freshman)** | | | | | | | | | | | |
| MATH | 101 | Calculus I | 4 | 0 | 4 | MATH | 102 | Calculus II | 4 | 0 | 4 |
| PHYS | 101 | General Physics I | 3 | 3 | 4 | PHYS | 102 | General Physics II | 3 | 3 | 4 |
| ENGL | 101 | An Intro to Academic Discourse | 3 | 0 | 3 | ENGL | 102 | Intro to Report Writing | 3 | 0 | 3 |
| CHEM | 101 | General Chemistry I | 3 | 4 | 4 | ICS | 102 | Intro. To Computing I | 2 | 3 | 3 |
| IAS | 111 | Belief & its Consequences | 2 | 0 | 2 | IAS | 101 | Practical Grammar | 2 | 0 | 2 |
| PE | 101 | Physical Education I | 0 | 2 | 1 | PE | 102 | Physical Education II | 0 | 2 | 1 |
| | | | 15 | 9 | 18 | | | | 14 | 8 | 17 |
| **Second Year (Sophomore)** | | | | | | | | | | | |
| COE | 202 | Digital Logic Design | 3 | 0 | 3 | ICS | 202 | Data Structures | 3 | 3 | 4 |
| COE | 203 | Digital Logic Design Lab | 0 | 3 | 1 | ICS | 253 | Discrete Structures I | 3 | 0 | 3 |
| ICS | 201 | Intro. To Computing II | 3 | 3 | 4 | EE | 203 | Electronics I | 3 | 3 | 4 |
| EE | 201 | Electric Circuits I | 3 | 3 | 4 | IAS | 212 | Professional Ethics | 2 | 0 | 2 |
| MATH | 201 | Calculus III | 3 | 0 | 3 | COE | 241 | Data & Computer Communications | 3 | 0 | 3 |
| IAS | 201 | Objective Writing | 2 | 0 | 2 | STAT | 319 | Prob.& Stat. for Engineers | 3 | 0 | 3 |
| | | | 14 | 9 | 17 | | | | 17 | 6 | 19 |
| **Third Year (Junior)** | | | | | | | | | | | |
| MATH | 260 | Differential Eqs. & Lin. Algebra | 3 | 0 | 3 | COE | 306 | Introduction to Embedded Systems | 3 | 3 | 4 |
| ENGL | 214 | Academic & Professional Comm. | 3 | 0 | 3 | D.E. | | COE 444 or COE 405 | 3 | 0 | 3 |
| IAS | 301 | Language Comm. Skills | 2 | 0 | 2 | GS | xxx | GS Elective 1 | 3 | 0 | 3 |
| COE | 301 | Computer Organization | 3 | 3 | 4 | COE | 300 | Principles of Comp. Eng. Design | 1 | 3 | 2 |
| COE | 344 | Computer Networks | 3 | 3 | 4 | ICS | 324 | Database | 3 | 3 | 4 |
| SE | 307 | Eng. Economy Analysis | 3 | 0 | 3 | IAS | 322 | Human Rights in Islam | 2 | 0 | 2 |
| | | | 17 | 6 | 19 | | | | 15 | 9 | 18 |
| **Summer Session** | | | | | | COE | 350 | Start of COOP | **0** | **0** | **0** |

| Fourth Year (Senior) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COE | 351 | COOP | 9 | 0 | 9 | COE | 485 | Senior Design Project | 1 | 6 | 3 |
| | | | | | | ICS | 431 | Operating Systems | 3 | 3 | 4 |
| | | | | | | COE | 4xx | COE Elective 1 | 3 | 0 | 3 |
| | | | | | | COE | 4xx | COE Elective 2 | 3 | 0 | 3 |
| | | | | | | GS | xxx | GS Elective 2 | 3 | 0 | 3 |
| | | | 9 | 0 | 9 | | | | 13 | 9 | 16 |
| **Total credit hours required in Degree Program : 133** | | | | | | | | | | | |

## Table 3 – COE Curriculum with No Coop Option

| Course (Department, Number, Title) List all courses in the program by term starting with first term of first year and ending with the last term of the final year. | Indicate Whether Course is Required, Elective or a Selected Elective by an R, an E or an SE.[2] | Curricular Area (Credit Hours) | | | |
|---|---|---|---|---|---|
| | | Math & Basic Sciences | Engineering Topics Check if Contains Significant Design (√) | General Education | Other |
| **1-FALL** | | | | | |
| MATH 101 Calculus I | R | 4 | | | |
| PHYS 101 General Physics I | R | 4 | | | |
| ENGL 101 An Intro to Academic Discourse | R | | | | 3 |
| CHEM 101 General Chemistry I | R | 4 | | | |
| IAS 111 Belief & its Consequences | R | | | 2 | |
| PE 101 Physical Education I | R | | | | 1 |
| **1-SPRING** | | | | | |
| MATH 102 Calculus II | R | 4 | | | |
| PHYS 102 General Physics II | R | 4 | | | |
| ENGL 102 Intro to Report Writing | R | | | | 3 |
| ICS 102 Intro. To Computing I | R | | | | 3 |
| IAS 101 Practical Grammar | R | | | 2 | |
| PE 102 Physical Education II | R | | | | 1 |
| **2-FALL** | | | | | |
| COE 202 Digital Logic Design | R | | 3 (√) | | |
| COE 203 Digital Logic Design Lab | R | | 1 (√) | | |
| ICS 201 Intro. To Computing II | R | | | | 4 |
| EE 201 Electric Circuits I | R | | 4 (√) | | |
| MATH 201 Calculus III | R | 3 | | | |
| IAS 201 Objective Writing | R | | | 2 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **2-SPRING** | | | | | | | |
| ICS | 202 | Data Structures | R | | | | 4 |
| EE | 203 | Electronics I | R | | 4 (√) | | |
| IAS | 212 | Professional Ethics | R | | | 2 | |
| COE | 241 | Data & Computer Communications | R | | 3 (√) | | |
| STAT | 319 | Prob.& Stat. for Engineers | R | 3 | | | |
| **3-FALL    3-SPRING** | | | | | | | |
| MATH | 260 | Differential Eqs. & Lin. Algebra | R | 3 | | | |
| ICS | 253 | Discrete Structures I | R | 3 | | | |
| ENGL | 214 | Academic & Professional Comm. | R | | | | 3 |
| COE | 301 | Computer Organization | R | | 4 (√) | | |
| COE | 344 | Computer Networks | R | | 4 (√) | | |
| **3-SPRING** | | | | | | | |
| COE | 306 | Introduction to Embedded Systems | R | | 4 | | |
| IAS | 301 | Language Comm. Skills | R | | | 2 | |
| D.E. | | COE 444 or COE 405 | SE | | 3 (√) | | |
| T.E. | | Technical Elective 1 | E | | 3 (√) | | |
| COE | 300 | Principles of Comp. Eng. Design | R | | 2 (√) | | |
| SE | 307 | Eng. Economy Analysis | R | | | | 3 |
| **Summer Session** | | | | | | | |
| COE | 399 | Summer Training | R | | 0 (√) | | |
| **4-FALL** | | | R | | | | |
| ICS | 431 | Operating Systems | R | | | | 4 |
| COE | 4xx | COE Elective 1 | R | | 3 (√) | | |
| COE | 4xx | COE Elective 2 | R | | 3 (√) | | |
| T.E. | | Technical Elective 2 | E | | 3 (√) | | |

| Course | Indicate Whether Course is R/E/SE | Math & Basic Sciences | Engineering Topics Check if Contains Significant Design (√) | General Education | Other |
|---|---|---|---|---|---|
| GS xxx GS Elective 1 | E | | | | 3 |
| **4-SPRING** | R | | | | |
| COE 485 Senior Design Project | R | | 3 (√) | | |
| IAS 322 Human Rights in Islam2 | R | | | 2 | |
| COE 4xx COE Elective 3 | E | | 3 (√) | | |
| COE 4xx COE Elective 4 | E | | 3 (√) | | |
| GS xxx GS Elective 2 | E | | | | 3 |
| | | | | | |
| TOTALS-ABET BASIC-LEVEL REQUIREMENTS | | 32 | 53 | 12 | 35 |
| OVERALL TOTAL CREDIT HOURS FOR THE DEGREE (**With No Coop**) 132 | | | | | |
| PERCENT OF TOTAL | | 24 | *40* | *9* | *27* |
| Total must satisfy either credit hours or percentage — Minimum Semester Credit Hours | | 32 Hours | 48 Hours | | |
| Minimum Percentage | | 25% | 37.5 % | | |

**Table 4 – COE Curriculum with Coop Option**

| Course<br>(Department, Number, Title)<br>List all courses in the program by term starting with first term of first year and ending with the last term of the final year. | Indicate Whether Course is Required, Elective or a Selected Elective by an R, an E or an SE.[2] | Curricular Area (Credit Hours) | | | |
|---|---|---|---|---|---|
| | | Math & Basic Sciences | Engineering Topics<br>Check if Contains Significant Design (√) | General Education | Other |
| **1-Fall** | | | | | |
| MATH 101 Calculus I | R | 4 | | | |
| PHYS 101 General Physics I | R | 4 | | | |
| ENGL 101 An Intro to Academic Discourse | R | | | | *3* |
| CHEM 101 General Chemistry I | R | 4 | | | |

| | | | | | |
|---|---|---|---|---|---|
| IAS 111   Belief & its Consequences | R | | | 2 | |
| PE 101   Physical Education I | R | | | | 1 |
| **1-Spring** | | | | | |
| MATH 102   Calculus II | R | 4 | | | |
| PHYS 102   General Physics II | R | 4 | | | |
| ENGL 102   Intro. To Report Writing | R | | | | 3 |
| ICS 102   Intro. To Computer Programming | R | | | | 3 |
| IAS 101   Practical Grammar | R | | | 2 | |
| PE 102   Physical Education II | R | | | | 1 |
| **2-Fall** | | | | | |
| COE 202   Digital Logic Design | R | | 3(√) | | |
| COE 203   Digital Logic Design Lab | R | | 1(√) | | |
| ICS 201   Intro to Computing II | R | | | | 4 |
| EE 201   Electric Circuit | R | | 4(√) | | |
| MATH 201   Calculus III | R | 3 | | | |
| IAS 201   Objective Writing | R | | | 2 | |
| **2-Spring** | | | | | |
| ICS 202   Data Structure | R | | | | 4 |
| ICS 253   Discrete Mathematics I | R | 3 | | | |
| EE 203   Electronic I | R | | 4(√) | | |
| IAS 212   Professional Ethics | R | | | 2 | |
| COE 241   Data & Computer Communication | R | | 3(√) | | |
| STAT 319   Prob& stat. for Engineering | R | 3 | | | |
| **3-Fall** | | | | | |
| MATH 260   Differential Equ. & Linear Algebra | R | 3 | | | |
| ENGL 214   Academic and Professional Comm. | R | | | | 3 |
| IAS 301   Language and Comm. Skills | R | | | 2 | |
| COE 301   Computer Organization | R | | 4(√) | | |
| COE 34$   Computer Networks | R | | 4(√) | | |
| SE 307   Eng. Economy Analysis | R | | | | 3 |
| **3-Spring** | | | | | |

| Course | | | | | |
|---|---|---|---|---|---|
| COE 306   Introduction to Embedded Systems | R | | *4(√)* | | |
| D.E   COE 444 or COE 405 | SE | | *3(√)* | | |
| G.S   General Studies Elective | E | | | *3* | |
| COE 300   Principal of Comp. Eng. Design | R | | *2(√)* | | |
| ICS 324   Database | R | | | | *4* |
| IAS 322   Human Rights in Islam | R | | | *2* | |
| **4-Fall** | | | | | |
| COE 351   COOP | R | | *9(√)* | | |
| **4-Spring** | | | | | |
| COE 485   Senior Design Project | R | | *3(√)* | | |
| ICS 431   Operating Systems. | R | | | | *4* |
| COE 4xx   COE Elective 1 | E | | *3(√)* | | |
| COE 4xx   COE Elective 2 | E | | *3(√)* | | |
| GS xxx   General Studies Elective 2 | SE | | | *3* | |
| | | | | | |
| TOTALS-ABET BASIC-LEVEL REQUIREMENTS | | 32 | *50* | *18* | *33* |
| OVERALL TOTAL CREDIT HOURS FOR THE DEGREE (**With Coop**) | 133 | | | | |
| PERCENT OF TOTAL | | 24 | *38* | *14* | *25* |
| Total must satisfy either credit hours or percentage | Minimum Semester Credit Hours | 32 Hours | 48 Hours | | |
| | Minimum Percentage | 25% | 37.5 % | | |