**Kingdom of Saudi Arabia**

**The National Commission for Academic Accreditation & Assessment**

**T5. COURSE REPORT**

**(CR)**

A separate Course Report (CR) should be submitted for every course and for each section or campus location where the course is taught, even if the course is taught by the same person. Each CR is to be completed by the course instructor at the end of each course and given to the program coordinator

A combined, comprehensive CR should be prepared by the course coordinator and the separate location reports are to be attached.

**Course Report**

For guidance on the completion of this template refer to the NCAAA handbooks.

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| Institution: Umm Al-Qura University Date of CR:  |
| College/ Department: Applied Science / Mathematical Science |

A Course Identification and General Information

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| 1. Course title Banach spaces Code 404416-3 Section #  |
| 2. Name of course instructor Location Alabdia |
| 3. Year and semester to which this report applies. Eighth level |
| 4. Number of students starting the course? Students completing the course? |
| 5. Course components (actual total contact hours and credits per semester):  |
|  | Lecture | Tutorial | Laboratory/Studio | Practical | Other: | Total |
| ContactHours | 42 |  |  |  |  | 42 |
| Credit | 3 |  |  |  |  | 3 |

B- Course Delivery

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| 1. Coverage of Planned Program |
| Topics Covered | Planned Contact Hours | Actual Contact Hours | Reason for Variations if there is a difference of more than 25% of the hours planned |
| Review of metric spaces. Normed linear spaces and Banach spaces. Examples: Sequence spaces $L^{p}$ ($1\leq p\leq \infty $) and $c\_{0}$ ; spaces $C(X)$ of bounded continuous functions. Proofs of completeness of these spaces. | 8 |  |  |
| Special properties of finite-dimensional normed linear spaces.Bounded linear and multi-linear mappings.  | 8 |  |  |
| Closed graph theorem. Open mapping Theorem. Han-Banach Theorem. | 8 |  |  |
| Hilbert spaces. Basic properties. Orthogonal systems and the orthogonalization process.Representation of linear functional on Hilbert space. | 8 |  |  |
| Orthogonal projections to closed subspacesOrthogonal complementsLinear functionals and duality. Dual $L^{p}$ is $L^{q}$. Second dual and reflexive spaces. | 8 |  |  |

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| 2. Consequences of Non Coverage of Topics For any topics where the topic was not taught or practically delivered, comment on how significant you believe the lack of coverage is for the course learning outcomes or for later courses in the program. Suggest possible compensating action.  |
| Topics (if any) not Fully Covered | Effected Learning Outcomes | Possible Compensating Action |
|  |  |  |

3. Course learning outcome assessment.

|  |  |  |  |
| --- | --- | --- | --- |
|  | List course learning outcomes | List methods of assessment for each LO | Summary analysis of assessment results for each LO |
| 1.1 | Explain clearly properties of normed linear spaces | ExamsHome work. |  |
| 1.2 | Students know the notions of the Banach space and the linear operator as well as basic examples.  |  |
| 2.1 | Students know the Hahn-Banach theorem and its basic applications to Banach spaces and operators acting on them.  | ExamsQuizzes.Homework.Discussion  |  |
| 2.2 | Students know basic properties of Hilbert spaces. |  |

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| Summarize any actions you recommend for improving teaching strategies as a result of evaluations in table 3 above. |

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| 4. Effectiveness of Planned Teaching Strategies for Intended Learning Outcomes set out in the Course Specification. (Refer to planned teaching strategies in Course Specification and description of Domains of Learning Outcomes in the National Qualifications Framework) |
| List Teaching Methods set out in Course Specification | Were TheyEffective? | Difficulties Experienced (if any) in Using the Strategy and Suggested Action to Deal with Those Difficulties. |
| No | Yes |
| Lectures |  |  |  |
| Tutorials |  |  |  |
| Discussion |  |  |  |
| Problem Solving |  |  |  |

**Note:** In order to analyze the assessment of student achievement for each course learning outcome, student performance results can be measured and assessed using a KPI, a rubric, or some grading system that aligns student work, exam scores, or other demonstration of successful learning.

C. Results

1 . Distribution of Grades

|  |  |  |  |
| --- | --- | --- | --- |
| LetterGrade | Number ofStudents | StudentPercentage | Analysis of Distribution of Grades |
| A |  |  |  |
| B |  |  |  |
| C |  |  |  |
| D |  |  |  |
| F |  |  |  |
| DeniedEntry |  |  |  |
| In Progress |  |  |  |
| Incomplete |  |  |  |
| Pass |  |  |  |
| Fail |  |  |  |
| Withdrawn |  |  |  |

| 2. Analyze special factors (if any) affecting the results |
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| 3. Variations from planned student assessment processes (if any) (see Course Specifications).  |
| a. Variations (if any) from planned assessment schedule (see Course Specifications) |
| Variation | Reason |
|  |  |
|  |  |
|  |  |
| b. Variations (if any) from planned assessment processes in Domains of Learning (see Course Specifications) |
| Variation | Reason |
|  |  |
|  |  |
|  |  |

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| 4. Student Grade Achievement Verification (eg. cross-check of grade validity by independent evaluator). |
| Method(s) of Verification | Conclusion |
|   |  |
|  |  |

D Resources and Facilities

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| --- | --- |
| 1. Difficulties in access to resources or facilities (if any) | 2. Consequences of any difficulties experienced for student learning in the course. |

E. Administrative Issues

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| --- | --- |
|  1 Organizational or administrative difficulties encountered (if any) | 2. Consequences of any difficulties experienced for student learning in the course. |

F Course Evaluation

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| 1 Student evaluation of the course (Attach summary of survey results)  |
| a. List the most important recommendations for improvement and strengths |
| b. Response of instructor or course team to this evaluation |
| 2. Other Evaluation (eg. by head of department, peer observations, accreditation review, other stakeholders) |
| a. List the most important recommendations for improvement and strengths |
| b. Response of instructor or course team to this evaluation |

G Planning for Improvement

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| 1. Progress on actions proposed for improving the course in previous course reports (if any). |
| Actions recommendedfrom the most recent course report(s) | Actions Taken | Action Results | Action Analysis |
| a. |  |  |  |
| b. |  |  |  |
| c. |  |  |  |
| d. |  |  |  |

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| 2. List what other actions have been taken to improve the course (based on previous CR, surveys, independent opinion, or course evaluation). |

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| 3. Action Plan for Next Semester/Year  |
| Actions Recommended for Further Improvement | Intended Action Points (should be measurable) | StartDate | CompletionDate | Person Responsible |
| a. |  |  |  |  |
| b. |  |  |  |  |
| c. |  |  |  |  |
| d. |  |  |  |  |
| e. |  |  |  |  |

Name of Course Instructor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date Report Completed: \_\_\_\_\_\_\_\_\_\_\_\_

Program Coordinator: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date Received: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_