**Lab Experiment: 05**

**Title: Scrum & Incremental Model Application**

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**📘 ThesisHub Project – Scrum & Incremental Model Application**

**1. Project Analysis (Common for Both Models)**

**Project:** *ThesisHub – Online Thesis Supervisor Allocation & Management System*

**Problem**

* Supervisor allocation is currently manual (group formation, preference collection, CGPA sorting, teacher capacity).
* Teachers can supervise max 2 groups.
* Students + teachers collaborate on thesis tasks, evaluation, and progress management manually.

**Goals**

* Automate **group formation & supervisor allocation**.
* Ensure fairness (CGPA-based priority).
* Reduce chairman’s workload.
* Provide digital tools for **task assignment, tracking, evaluation & reporting**.

**Stakeholders**

* **Students** → form groups, select supervisors, perform thesis tasks.
* **Teachers** → accept/decline groups, assign tasks, evaluate submissions.
* **Chairman** → final approval of supervisor allocation.
* **System Admin** → manages system setup, users, and reports.

**2. Project Design (Common for Both Models)**

**Modules**

1. **Authentication & Profiles** (students, teachers, chairman).
2. **Group Formation & Teacher Preference Submission**.
3. **Supervisor Allocation Algorithm** (CGPA priority + teacher availability).
4. **Task Assignment & Progress Tracking**.
5. **Evaluation & Marking**.
6. **Notifications & Reports**.

**Example Data Flow (Input → Processing → Output)**

* **Input:** Student submits group + supervisor preferences.
* **Processing:** Sort groups by CGPA → allocate to teacher with available capacity.
* **Output:** Allocation record (group → supervisor mapping).

**3. Scrum Model Application**

**Scrum Steps Applied to ThesisHub**

1. **Product Backlog** – List of all features:
   * Login system, group formation, supervisor preference, allocation, task management, evaluation, reports.
2. **Sprint Planning**
   * Sprint 1 → Authentication + Profiles
   * Sprint 2 → Group formation + Preferences
   * Sprint 3 → Supervisor Allocation
   * Sprint 4 → Task Assignment + Evaluation
   * Sprint 5 → Notifications + Reports
3. **Sprint Execution** – Team codes, tests, integrates features.
4. **Daily Scrum** – Team updates progress, blockers.
5. **Sprint Review** – Demo to stakeholders.
6. **Sprint Retrospective** – Improve next sprint.

**Scrum Input & Output of Each Phase**

| **Phase** | **Input** | **Output** |
| --- | --- | --- |
| Product Backlog | Requirements list from stakeholders | Prioritized backlog |
| Sprint Planning | Product backlog | Sprint backlog (selected features) |
| Sprint Execution | Sprint backlog tasks | Working increment (feature done) |
| Daily Scrum | Progress updates | Updated task status + issues noted |
| Sprint Review | Completed increment | Approved/rejected increment |
| Sprint Retrospective | Team feedback | Process improvements + backlog updates |

**4. Incremental Model Application**

**Steps in Incremental Model**

1. Requirement Analysis → break project into increments.
2. Design → each increment has its own design.
3. Implementation → code increment.
4. Testing → validate increment.
5. Integration → merge increment into growing system.
6. Delivery → release partial but usable product.

**Increments for ThesisHub**

* **Increment 1** → Login + Profile Management
* **Increment 2** → Group Formation + Supervisor Preferences
* **Increment 3** → Supervisor Allocation Algorithm
* **Increment 4** → Task Assignment + Progress Tracking
* **Increment 5** → Evaluation + Notifications + Reports

**Incremental Input & Output of Each Phase**

| **Phase** | **Input** | **Output** |
| --- | --- | --- |
| Requirement Analysis | Problem statement, user needs | List of increments/modules |
| Design | Requirement for one increment | DB schema, UI flow, architecture |
| Implementation | Design documents | Developed increment (e.g., login) |
| Testing | Developed increment | Validated increment |
| Integration | Tested increment + existing system | Updated working system |
| Delivery | Integrated system | Partial/full usable system |

**5. ASCII Diagrams (Use for Hand Sketch or Report)**

**📘 Scrum Cycle for ThesisHub**

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| Product Backlog |

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| Sprint Planning |

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| Sprint Backlog |

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| Sprint Execution |

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| Daily Scrum |

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| Sprint Review |

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| Sprint Retrospective |

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(Feedback updates)

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| Product Backlog |

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👉 **Explanation:** It’s a continuous loop. Each cycle produces a working increment and updates the backlog.

**📘 Incremental Model Flow for ThesisHub**

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| Requirement Analysis|

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| System Design |

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|Increment| |Increment| |Increment| |Increment| |Increment|

| 1 | | 2 | | 3 | | 4 | | 5 |

|(Login & | |Group & | |Supervisor| | Task | |Eval & |

|Profiles)| |Prefs | |Allocation| |Tracking | |Reports |

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| | | | |

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(Delivery) (Delivery) (Delivery) (Delivery) (Final System)

👉 **Explanation:** Each increment passes through design → coding → testing → delivery.

Final system = all increments integrated.

**6. Hand-Sketching Guide**

✍️ When drawing by hand:

* **Scrum:** Draw a **circle/loop** with arrows between Product Backlog → Sprint Planning → Execution → Daily Scrum → Review → Retrospective → Backlog.
* **Incremental:** Draw **horizontal boxes** (Increment 1 → Increment 2 → Increment 3…) showing gradual growth of the system.

✅ With this full response, you now have:

* **Complete project analysis & design**
* **Scrum application (phases, inputs/outputs, cycle)**
* **Incremental application (increments, phases, inputs/outputs)**
* **ASCII diagrams for hand sketching or report use**