

An affordable lower limb prosthesis with polycentric knee joint, dynamic ankle joint and suction-suspension socket system having advanced features. Funding Agency- SERB(IMPRINT)

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Theme:- Healthcare; **Objectives:-** (i) Design and development prosthetic knee joint with patient specific link length variation, knee rotation and prosthesis alignment mechanism. (ii) A direct socket fabrication technique with suction-suspension mechanism to increase the fitment and comfort level of amputee by reducing exhaustive conventional technique. (iii) A topologically optimized dynamic ankle joint and FRP foot to minimize the impact load and increase the body balance during uneven terrain walking. (iv) Testing facility as per ISO-10328 to test developed prosthesis. (v) Patient Trial and rehabilitation feedback.

Deliverables:

- ❖ Adjustable Knee joint link length to increase the stability or ease in flexion along with deep squat sitting flexion; cross-legged sitting on floor using knee rotation, TKA alignment option to align the socket, knee, and ankle as per the need.
- ❖ Smart socket for direct usage is developed through FEM with variable designs to meet the requirements of subjects .
- ❖ Ankle joint is designed and developed as per ISO 10328 which provides the desired kinematic requirements to perform walking in uneven terrain.
- ❖ A porous structured - breathable – stretchable prosthetic liner is developed to provide compressive force to maintain constant volume in stump.
- ❖ With an aid of affordable assistive devices, amputees shift towards reintegration into society to overcome the other social factors such as employability and productivity that influence to make them as working individual.

